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LEADERSHIP IN COACHING: DESCRIPTION AND EVALUATION

by

RICHARD RAYMOND DANIELSON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

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ABSTRACT

A study was conducted with the two-fold purpose of describing and evaluating leadership in hockey coaching. To this end a stratified-random sample was made of 48 hockey teams from Bantam-BB, Bantam-AA, Midget-BB and Midget-AA leagues in the city of Edmonton. Subsequent analyses were performed on 506 players and 40 coaches representing 10 teams from each league. The player sample comprised 81.58 per cent of the total 619 players on the 40 teams. Age, socioeconomic status, playing experience, coaching experience and coaching motivation data were obtained from the coaches. Age and socioeconomic status were obtained from the athletes.

Two questionnaires was used with the athletes (Coach Behavior Description Questionnaire, Learning Environment Inventory), and a sport-specific observational schedule were used with the coaches (Dalhousie Coach Observation Schedule). The observational measures were taken in game and practice situations on coaches whose teams were involved in playoffs.

In the description of coaching leadership in hockey the following results were found:

1. There were 3 unrelated dimensions of classification of hockey coaches on the basis of personal data; namely in

terms of experience, playing experience and motivation.

2. There were 4 team interpersonal environments obtained as a result of athletes' joint perception of coaching behavior and team environments. They were named Player-dominated, Coach-dominated, Goal-dominated and System-dominated.

3. There were 2 styles of coaching in the analysis on observational coaching behavior - one involving interpersonal interaction with the players and one unrelated to interaction.

4. Coaches with either less than average experience or more than average playing experience were found to be related to team environments perceived as being Coach-dominated. Coaches with more than average experience were associated with Player-dominated environments and coaches with higher than average interpersonal motivation were associated with Goal-dominated environments.

In the evaluation of hockey leadership the following results were found :

1. The objective criterion of win-loss ratio as operationalized by percentage of total possible points obtained per team over the season, was positively related to Goal-dominated environments defined in terms of team cohesiveness, goal direction and member satisfaction. Win-loss ratio was therefore taken as the measure of coaching effectiveness.

2. Goal-dominated teams were found to be more successful

than Coach-dominated teams. No relationship was found between coaching effectiveness and either Player-dominated teams or System-dominated teams.

3. Motivation, as indicated by LPC score, was found to be significantly related to coaching effectiveness. This relationship was seen either across the entire sample of 40 coaches or in terms of situation favorableness when the situation was defined as either favorable or unfavorable for leadership. No relationship was found between LPC and coaching effectiveness in situations of medium favorableness.

4. Personal coaching variables of either experience or playing experience were found to be unrelated to coaching effectiveness.

5. Observed coaching behaviors were found to be unrelated to coaching effectiveness.

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CHAPTER 1

STATEMENT OF THE PROBLEM

Introduction

There has been evidenced, in recent years, increasing concern about the quality of coaching in amateur sport in Canada (e.g. Albinson,1973; Orlick,1973; Percival,1971). Attention has been called to the need for an evaluation of the objectives in amateur sport, and a modification of coaching techniques to better meet the needs of young athletes.

While various authors have criticized the coach as to his lack of technical expertise (Percival,1971), his lack of psychological expertise (Orlick,1973; Percival,1971) and his motives for being involved in coaching in the first place (Albinson,1973), few have been concerned with a systematic multi-method description and evaluation of leadership in coaching. This study was designed to deal with this problem.

Need for the Study

Recent theorists in sport psychology (e.g. Orlick, 1973) have argued that participation in amateur sport in Canada is low because of the situation in which the particular sport is played. Of the many variables which could be labeled situational, some of the most important are

dependent upon the coach who seems to have a strong personal, motivational and behavioral influence on athletes. By virtue of his position, he may or may not set up appropriate contingencies of reinforcement, emphasize or de-emphasize winning and intragroup competition and act or not act as a store of technical information upon which an athlete can draw. In light of these points, it seemed fruitful to measure the effect and the activity of the amateur sport coach in the above areas. Reinforcement has been proposed by many (McKenzie and Rushall, 1973; Orlick, 1973; Rushall and Siedentop, 1972; Rushall, 1973; Smith, 1974) as having desirable effects on self-concept and performance in sport. Therefore it is important to have information on how frequently coaches give reinforcement to athletes. However, equally important is knowledge about what kinds of coaching behaviors are reinforcing to athletes. The athlete (or coach) can give introspective reports of the type of coaching behavior he believes to be elicited by the coach within a particular sporting situation, but this report could be influenced by such individual difference variables as temperamental traits, sex and motivational needs of the person giving the report. Standard personality tests can give information about temperament, needs, mood states and abilities of coaches, but do not give information about behavior as perceived by athletes or spectators. In the area of leadership in coaching a multi-method measurement technique should be used to obtain data from

athletes, coaches and independent observers. It is possible that use of different techniques on different persons will help to give a more complete description of coaching leadership and will contribute to the balancing out of different sources of measurement error. A comparison of these techniques, in addition, would allow determination of the validity of each using measures of coaching effectiveness as criteria. All of this information would help to identify variables which lead to positive relationships between coaches and athletes. These relationships, in turn, can help in both the training and selection of coaches involved in amateur sport.

In summary, there was a need to empirically verify contentions that have been made by physical educators, coaches, sports columnists and parents as to the inadequacy of coaching in amateur sport. Criticisms of this type are necessary for the improvement of sport, but what is more important is the need to specify <u>in what ways</u> coaching is adequate or inadequate, and to suggest how this information can be used in the design and implementation of programs in sport. One method by which to acquire this information, would seem to be the determination of interactions between coaching personality, coaching behaviors and other specific situational factors in sport. This was attempted in the present study.

<u>The Problem</u>

In this study, the descriptive phase was conceptually separated from the evaluative phase. In the former, emphasis was placed on the obtainment of objective information regarding coaching. So as to facilitate this strategy, coaching was presumed to be a specific example of leadership. In other words, the coach was assumed to hold an influential position in the social structure of the team.

This assumption does not imply that other members of the team cannot hold positions of power. Indeed, just as Gibb (1969b:215) drew a distinction between focused and distributed leadership, one could make a similar distinction in this situation. The significant point is that in this study primary concern was focused on the coach, notwithstanding that some if not many leadership functions may be distributed among the team members. In the description of coaching leadership then, two points of view were explored - that of the team and that of an independent observer.

The second major problem was in the evaluation of coaching leadership. This problem was connected with description but also involved the utilization of appropriate criteria against which to evaluate effectiveness of particular techniques. Fiedler (1967, 1971b) has proposed a model by which leadership effectiveness in task groups can be evaluated. A modification of this model was used in the present study, along with more specific approaches to the

problem of evaluation in coaching.

The major problems lay then, in a) the description of coaching leadership by the utilization of athletes' perceptions and independent observation, and in b) the evaluation of coaching leadership.

Subproblems

Arising out of the two major problems, a number of general subproblems were identified:

1. It was necessary to define the relationship between coaching leadership as it is perceived by athletes and the evaluation of coaching leadership.
2. It was necessary to define the relationship between coaching leadership as it is identified by independent observation, and the evaluation of coaching leadership.
3. It was necessary to define the relationship between coaching leadership as it is identified by athletes, and by independent observation.
4. It was necessary to define the relationship between the evaluation of coaching leadership using pure task performance criteria (for example, win-loss ratio) and interpersonal criteria such as team members' satisfaction.
5. It was necessary to determine whether certain other variables such as age of players, skill level of players, age of coach, experience of coach, personal structure of coach and socioeconomic variables of either the players or

the coach can modify relationships found in either the major problems or subproblems.

Definition of Terms

1. Perceived Coaching Behavior - behavioral dimensions of coaches as perceived by athletes. Operationalized in team scores on 5 scales of the Coach Behavior Description Questionnaire (CBDQ) (Danielson et al, 1974).

2. Perceived Team Environment - social environment of the team as perceived by athletes. Operationalized in team scores on 15 dimensions of the Learning Environment Inventory (LEI) (Anderson, 1973).

3. Observed Coaching Behavior - behavior of coaches as operationalized by observer rating using the Dalhousie Coach Observation Schedule (DCOS) (Rushall, 1973). Specifically, the rate of response to 7 behavioral categories during team practice and during game situations.

4. Coaching Motivational Style - score on the Least Preferred Coworker (LPC) scale as defined by Fiedler (1967) and modified for use in sport situations.

5. Task Structure - degree to which team members agree on goal clarity. Operationalized by team score on Learning Environment Inventory (LEI) scale of Goal Direction.

6. Coach-Athlete Relations - interpersonal relationships between coach and athletes. Operationalized by coaches' scores on Group Atmosphere scale (Fiedler, 1967).

7. Win-loss ratio - percentage of maximum possible points

actually obtained by a team during league play.

Delimitations

The study was delimited to a representative sample of hockey teams from the city of Edmonton. The age range was from 12 to 16 years. Ten teams from each of the following four leagues were included: Bantam BB, Bantam AA, Midget BB and Midget AA.

Further delimitations of the study were that a) all measures were taken after the end of league play, and b) only the person designated on the team registration list as the coach was considered to be the coach.

Limitations

The present study was limited by the following:

1. The sample was not a pure stratified random sample, but a representative sample with equal numbers of teams in each league. This factor limits the generalizability of results.
2. The observational measures were taken only on coaches whose teams had made the playoffs and only one observation for each of game and practice behavior was used for analytical purposes. The first point may have had an attenuating effect on correlations between observational measure and other descriptions of coaching, as well as correlations between observational measures and outcome measures. The second point is a limitation in that

observational scales such as the DCOS are primarily intended for longitudinal modification of observed behavior, rather than cross-sectional classification of observed behavior.

3. The present study was cross-sectional in nature and the fact that testing was done after the season, could have produced results which were only partly representative of those obtained had the testing been done during the season.

4. In the factor analytic treatment of results, only one model was applied, namely incomplete principal components analysis. This could have mitigated against a true representation of the underlying factors in the domains tested.

CHAPTER II

REVIEW OF THE LITERATURE

Leadership - Theory and Measurement

A great deal of interest has been centered around the concept of leadership for many years. The topic has been addressed by writers in such varied fields as literature, philosophy, history, economics, sociology and psychology.

The current interest in leadership shown by psychologists, began in the period following the Second World War. Since that time many theories, models and prescriptions have been proposed. There are contrasting points of view that have been taken due to differing orientations of the writers. Industrial psychologists have taken positions ranging from descriptions of leadership in an organizational milieu (Tannenbaum et al, 1961) to normative prescriptions for decision-making (Vroom and Yetton, 1973). Theorists in personality have repeatedly attempted to establish formulae for personality traits of leaders (Mann, 1959). Social psychologists have investigated the processes involved in small group interaction (Bales, 1950). In addition, definitions of the leader have been made in terms of his position as an individual in a given office, focus for the behavior of group members, sociometric choice, influence in the relationships over others in the group,

influence in the general direction of group movement (syntality) and leadership behaviors (Gibb, 1969b: 210-215).

As far as leadership theories are concerned, there appear to be three general orientations. The first assumes that there is a unitary trait of leadership which is necessarily demonstrated in all cultures and situations, and only by leaders. This theory is accepted in some degree by the layman, but is given little support in psychology. The second theory Gibb calls the "constellation-of-traits" theory. This is an expanded version of the first theory in that the personality traits postulated to be characteristic of leaders are basically the same as those postulated to be found in the unitary trait of leadership, except that they are arranged in a constellation and leaders are defined to be those persons with a particular profile of traits.

What is lacking in both of the above theories is some consideration of the influence of the situation in the determination of leadership. This consideration is given in theories which are interactional in nature (e.g. Hollander, 1964; Fiedler, 1967). Major variables influencing leadership which are postulated in interaction theories are as follows:

1. The personality of the leader,
2. The followers, with their attitudes, needs, and problems,
3. The group itself as regards both
    a) structure of interpersonal relations and
    b) syntality characteristics,
4. The situations as determined by physical setting, nature of task, etc. (Gibb, 1969b: 268).

A major qualifying variable to the above four points is that of perception. It is not the variables themselves which interact to affect leadership, but the leader's perception of his followers and vice versa, and the joint perception by each of to the group and the nature of the task. Emphasis would be then placed on the conception of leadership as an influence relationship in which both leader and followers are taken into consideration. Also needed in Gibb's estimation, is more emphasis on the relationship between the group or organization, and the leader-follower interaction. This demand is partially met in examinations of leadership effectiveness (e.g. Fiedler, 1967), but not completely as indicated by the dearth of work centered around leadership maintenance and emergence. Marak (1964) and Julian et al (1969) have commented on this problem.

The emergence and maintenance of leadership are important in a complete study of the phenomenon as it is involved in coaching. The present study is restricted however, to the cross-sectional description and evaluation of leadership in coaching and did not address the two other problems. Attention now, will be focused on one of the major lines of leadership research in the 1950's, namely that of the study of leader behavior.

The Study of Leader Behavior

One of the more promising ways of investigating the

phenomenon of leadership is to look at how the leader goes about his job. This is the methodology which was adopted by the Ohio State Leadership Studies group (Stogdill and Coons,1957). This group defined leader behavior as "...the behavior of an individual when he is directing the activities of a group to a shared goal (Hemphill and Coons,1957:8)."

From an initial item pool of 1790 different behaviors, this group produced a 150-item questionnaire entitled the Leader Behavior Description Questionnaire or LBDQ . The questionnaire was designed to measure how a leader behaves when operating as a leader as opposed to what he does in that situation. Table 1 shows the nine a priori dimensions used in generating items for the original LBDQ.

Hemphill and Coons (1957) administered the LBDQ to 357 individuals ages 18 to 52 years. Of the 357, 152 described themselves as leaders and 205 described the behavior of leaders from the point of view of subordinates. In addition to the descriptive phase, all subjects were required to rate the described leader on a 7-point scale of general effectiveness. The authors noted that when the same questionnaire was used to both describe and evaluate leader behavior, a substantial correspondence was found. Subordinates and leaders tended to evaluate leader behavior slightly differently however, with the subordinates being more critical. Finally, it was noted that the nine a priori

TABLE 1

INITIAL ITEM SELECTION FOR THE LBDQ*

NO. ITEMS	DIMENSION NAME AND DESCRIPTION
15	INITIATION - The dimension, initiation, is described by the frequency with which a leader originates, facilitates, or resists new ideas and practices
16	MEMBERSHIP - The dimension, membership, is described by the frequency which a leader mixes with the group, stresses informal interaction between himself and members, or interchanges personal services with members
15	REPRESENTATION - The dimension, representation, is described by the frequency with which a leader defends his group against attack, advances the interests of his group and acts on behalf of the group
17	INTEGRATION - The dimension, integration, is described by the frequency which a leader subordinates individual behavior, encourages pleasant group atmosphere, reduces conflicts between members, or promotes individual adjustment to the group
18	ORGANIZATION - The dimension, organization, is described by the frequency with which a leader defines or structures his own work, the work of other members, or the relationships among members in the performance of their work
20	DOMINATION - The dimension, domination, is described by the frequency with which a leader restricts the behavior of individuals, or the group in action, decision-making, or expression of opinion
23	COMMUNICATION - The dimension, communication, is described by the frequency with which a leader provides information to members, seeks information from them, facilitates exchange of information, or shows awareness of affairs pertaining to the group
14	RECOGNITION - The dimension, recognition, is described by the frequency with which a leader engages in behavior which expresses approval or disapproval of the behavior of group members
12	PRODUCTION - The dimension, production, is described by the frequency with which a leader sets levels of effort or achievement, or prods members for greater effort or achievement
150	TOTAL NUMBER OF ITEMS

*from Hemphill and Coons, 1957: 11-12.

dimensions of behavioral stimuli were not independent. A centroid factor analysis of scores on each of the nine

scales yielded three factors. They were,

> 1. Maintenance of membership character - behavior which increases a leader's acceptability as a group member,
> 2. Objective attainment behavior - behavior related to group output, and
> 3. Group interaction facilitation - behavior stressing the organization of effective interaction among members (Hemphill and Coons, 1957: 24-27).

Of the three factors, the first was most highly related to subordinate evaluation of the leader. The authors noted that the three styles of leadership were descriptive of how the leader goes about his job and that all three could be equally used by a leader or disproportionately drawn from over different situations.

Halpin and Winer (1957) administered a 140-item version of the LBDQ to 52 air crews. Three hundred crew members described the behavior of 52 commanders. Scoring keys were developed for membership, communication, organization, production, domination, leadership quality, goal direction and initiative. The leadership quality key was constructed of items found in the initial study (Hemphill and Coons, 1957) to be highly related to the "halo-effect" or social desirability response set.

In a subsequent factor analysis four factors were found, two of which accounted for 83% of the common variance. The first factor was called Consideration and accounted for 49.6% of the variance. Behaviors characteristic of this factor were those involving "friendship, mutual trust, respect and warmth between the

aircraft commander and his crew (p.42)." Factor 2, entitled Initiating Structure (33.6% of variance), referred to the establishment of well-defined organizational patterns and means of getting jobs done. Factor 3 was entitled Production Emphasis and was concerned with motivation of members toward greater activity. This factor accounted for 9.8% of the common variance. The last factor, accounting for only 7% of the variance, was called Sensitivity (social awareness) and indicated an awareness of social relationships and pressures of crew members.

Development of the LBDQ has proceeded so that by 1962 there were 10 subscales (Stogdill et al, 1962) and in the present version, 12 subscales (Stogdill, 1963). The basic scales of the LBDQ are Consideration and Initiating Structure. According to empirical work summarized by Fleishman (1973) the "best type" of leader is one characterized by both high consideration and high initiating structure.

In two separate reviews of studies done using the LBDQ (Korman, 1966; Weissenberg and Kavanagh, 1972) criticisms have been made as to the two dimensions. Korman found that there in fact is very little relationship between the two dimensions as measured by the LBDQ, and organizational criteria. He also noted the absence of predictive validity studies using the LBDQ, and the lack of specific stipulation as to how situational factors could modify relationships

found with the two scales. Weissenberg and Kavanagh (1972) on the other hand, found that the two dimensions are not unrelated in all cases. Specifically, the dimensions are more independent for supervisors' self-report responses than for subordinates' perceptions.

The criticisms of the study of leader behavior are similar to those leveled at the personality conception of leadership. Use of consistency of behavior as a major variable has not apparently been as successful in the cross-situational study of leadership as is desired. Attention will now be given to a situational theory which has been a major focus of leadership research for 10 years.

The Contingency Model of Leadership Effectiveness

As was noted in the previous section, various investigators have acknowledged that leadership is both determined by and determines the situation. Fiedler (1967, 1971b) for one, specified the relationship between the personal characteristics of the leader and the situation. His concern was centered around task- rather than socially-oriented groups, but is of potential relevance in the study of coaching in sport.

Fiedler's theory is applicable mainly to interacting task groups although there is some evidence that it is also applicable to coacting task groups. These are groups in which members' activities must be coordinated to reach a

group goal. Possible examples of interacting task groups in sport would be hockey, basketball, soccer, volleyball and football. The leader's task in this kind of group is mainly to coordinate activities of various members so that the group functions smoothly and efficiently. Coacting groups, while somewhat outside the domain of Fiedler's theory, are seen in many sports such as wrestling, gymnastics, swimming, fencing, track and field and judo. Here, team members do not interact with one another, but act in parallel for a common cause. Their scores, while obtained independently, are added together to make a team score.

Fiedler notes that the function of the leader is different between the two groups. In coacting groups, the leader acts mainly as an advisor who motivates subordinates, gives emotional support and acts as an anxiety-reducing agent in times of stress. This is contrasted with the interacting group leader who is concerned mainly with coordination of team members' efforts toward the group goal. Out of necessity, more of the leader's time in interacting groups is spent on organization than in interpersonal interaction with members.

According to Fiedler, all leaders can be placed on a 'motivation-to-lead' continuum with one extreme being a task-oriented style, the other being a person-oriented style. The situational variables which are included in his theory are leader-member relations, structure of the task

around which the group is oriented and the position power of the leader, or the extent to which he can control the destinies of group members. The style of leadership is hypothesized to interact with the situation, in order to determine resultant effectiveness of leadership.

On the basis of the situational variables a three-dimensional model can be used to represent all the relationships. In turn, if each of the three dimensions is dichotomized, eight octants are obtainable. The eight different octants thus obtained are placed on a continuum of situation favorableness for leadership as shown in Table 2.

Octant 1 represents a highly favorable situation for a

TABLE 2

SITUATION FAVORABLENESS AS PROPOSED BY FIEDLER*

	FAVORABLE				UNFAVORABLE			
OCTANT	1	2	3	4	5	6	7	8
Leader-member Relations	Good	Good	Good	Good	Mod. Poor	Mod. Poor	Mod. Poor	Mod. Poor
Task Structure	Str.	Str.	Unst.	Unst.	Str.	Str.	Unst.	Unst
Leader Position Power	Str.	Weak	Str.	Weak	Str.	Weak	Str.	Weak

*from Fiedler 1971: 13

leader. His relationships with members are good, the task is structured and he has a great deal of power. The opposite is seen in octant 8. The basic assumption of Fiedler's model is that effectiveness of leadership varies across the eight

octants and concern should be given to the form of the relationship between the two styles of leadership and the eight situations shown in Table 2.

A major problem in the evaluation of leadership is that of the criterion. In Fiedler's case, as he delimits his model to task groups, the criterion of group performance on the task is appropriate. Using this criterion, he found (Fiedler,1971b: 13) that task-oriented leaders were more effective in situations which were either highly favorable or highly unfavorable (i.e. Octants 1-3 and 7-8) for leadership. Person-oriented leaders were more effective in situations of moderate favorableness.

The problem of the criterion against which to correlate leader effectiveness in sport situations will be addressed subsequently, as will the application of Fiedler's model to sport situations. Consideration is given here to methods by which personal characteristics of the leader have been assessed by Fiedler.

Fiedler's measure of personality or motivation was provided through the leader's evaluation of his least-preferred coworker (LPC) and his most-preferred coworker (MPC). The two combine together to give a composite score called "Assumed Similarity between Opposites" or ASo. For most purposes, the LPC score has been used for the measure of personality. The LPC is operationalized through a scale of 16 to 20 bipolar adjectives used to describe the least-

preferred coworker. The leader is required to rate this person on a scale from 1 to 8 for each pair of adjectives, and the score is added to give a scalar number representing the orientation of the leader. If the LPC score is high relative to the norm group, the leader is considered to be primarily person-oriented. This means that as he tends to rate his least-preferred coworker positively, he is separating the person's personality from his job performance. If the LPC score is low, the leader has evaluated his least-preferred coworker negatively and is thus considered to be primarily task-oriented. The LPC score therefore indicates an hierarchical arrangement of motivation. All leaders are presumed to be motivated by <u>both</u> person-oriented and task-oriented predilictions but it is the weighting of each style which varies across leaders.

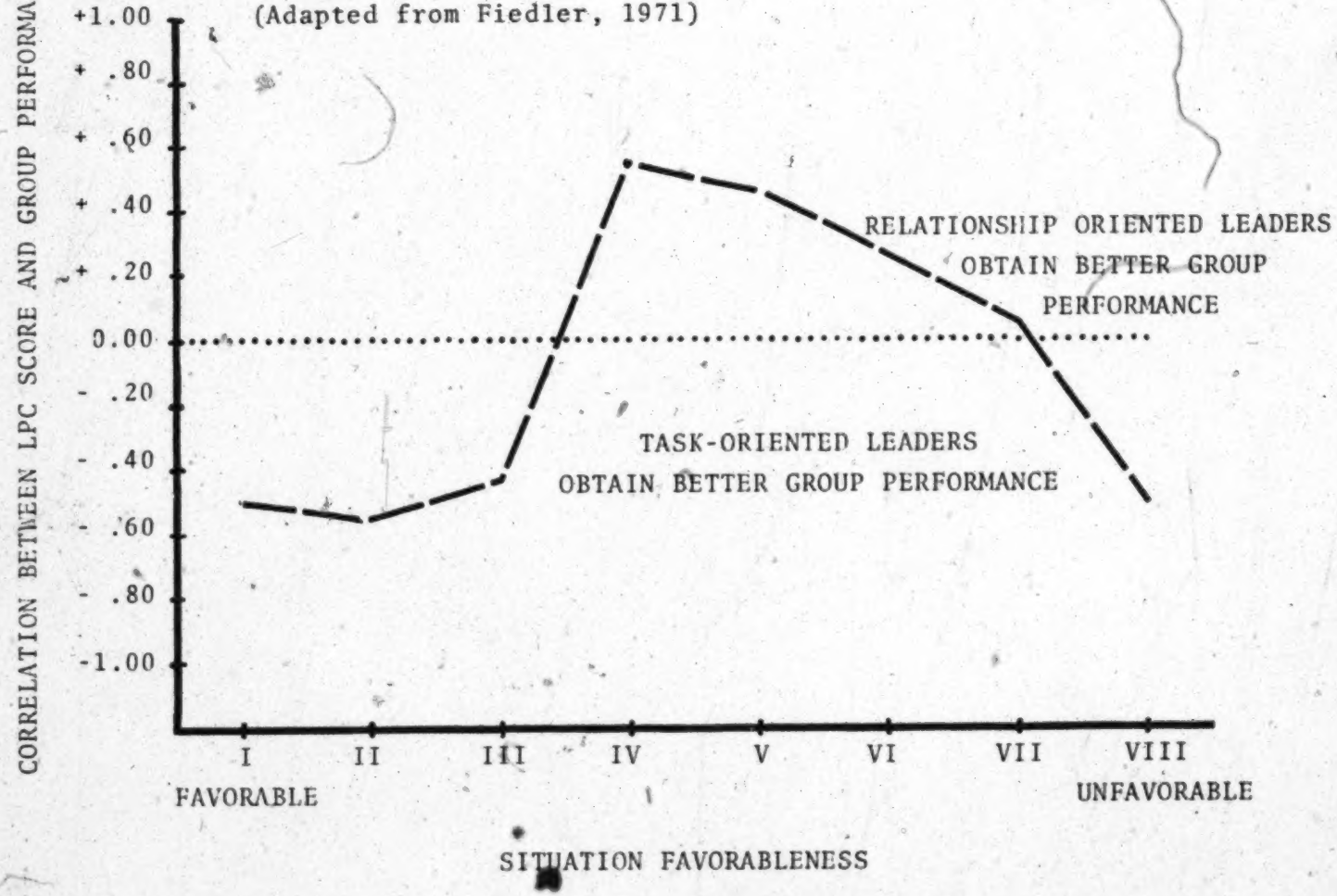
The criterion against which the relationship between LPC and situation is correlated, is that of performance on the group task. The theory predicts that a) groups with low LPC leaders will perform well in both <u>favorable</u> and <u>unfavorable</u> situations; and poorly in situations of medium favorableness, and b) groups with high LPC leaders will perform well in situations of <u>medium favorableness</u> and poorly in situations either highly favorable or highly unfavorable.

As the above discussion may be difficult to interpret, Figure 1 shows the same predictions graphically. The curve

FIGURE 1

CORRELATION BETWEEN LPC AND GROUP PERFORMANCE OVER 8 SITUATIONS

(Adapted from Fiedler, 1971)



Is a curve of correlations between LPC and group productivity ranging from -1.00 to +1.00. Values below zero therefore indicate that low LPC (task-oriented) leaders are more effective, while values above zero indicate that high LPC (relationship-oriented) leaders are more effective. Various empirical studies (eg. Fiedler, 1971b; Sashkin, 1972) have given some support to this position.

The point becomes obvious that for task groups there is no one best leader for all situations. Noting from Table 1 that situation favorableness is defined by leader-member relations, task structure and position power of the leader, it can be readily appreciated that a person who is highly successful (i.e. His group is successful) in one situation, can be unsuccessful in another situation. In fact, it has been shown that with changes in the situation due to human relations training, skill training, experience and/or changes in position power of the leader; group performance either improves of becomes poorer according to the style of the leader and the favorableness of the original situation (Fiedler, 1972a, 1972b; Csoka and Fiedler, 1972; Shiflett, and Nealey, 1972).

Fiedler's model appears to be quite powerful in uniting personality variables with situational variables. It also may have strong bearing on leadership in coaching, if it can be assumed that sport groups are classifiable as examples of task groups. However, as in the behavioral model outlined by

the Ohio Studies Group, there are problems with the Contingency model which require further consideration.

Criticisms of Fiedler's Theory

Various studies have cast some doubt on the universality of the Contingency model. In the study reported by Sashkin (1972), although the results were in accord with the predictions from the theory, behavioral predictions were not. Sashkin concluded that with respect to organizational engineering, or modifying the situation to suit the leader, "... The contingency model can be an effective tool when used selectively, even though it is not a very effective panacea (p. 360)."

Graen et al (1971a, 1971b) after obtaining contradictory results to the model, proposed the following:

1. Measure position power both a priori and by questioning the leader. This would obtain a measure of perceived power.
2. Change the task taxonomy from one based on instructions to one based on ratings of group outputs.
3. Monitor leadership style by both LPC and behavioral measures.
4. Manipulate group atmosphere rather than measure it post hoc.
5. Apply statistical reliability tests to the rank-order correlation between LPC and group performance.
6. Use analyses of variance to show the strength of

association of each source of variation on raw group performance (p.209).

Mitchell et al (1970) have also criticized the Contingency Model and proposed various solutions. With regard to the LPC score it has been found that test-retest reliability varies from .70 to .31. Other findings suggest that LPC could be a) related to an actual type of coworker rather than a dispositional trait of the leader (Fishbein et al,1969), b) that LPC could be a measure of cognitive complexity (Mitchell, 1970) and that c) LPC may not be a unitary concept (Yukl, 1970). The above writers have argued for more investigation into this variable. Mitchell (1970b) for example, found that high-LPC people differentiated more than low-LPC people between task and interpersonal characteristics of both people and situations. What these findings suggest, is caution in interpreting just what a high or low LPC score represents.

With regard to the situational favorableness dimensions, Mitchell et al (1970) caution that the group atmosphere scale may be an index of group reactions rather than leader-member relations. They also note that a) there is no metric for situation favorability thereby making comparisons across studies difficult, b) that important dimensions of situational favorability may be omitted, and c) that in fact situation favorableness is leader-centered.

In a recent criticism of both the empirical and

theoretical underpinnings of the Contingency model, Ashour (1973) argued for larger sample sizes, monitoring of leader and group behavior, other measures of the leader's personality in addition to the LPC variable, and a more complex definition of the situation. His overall suggestion was to include more emphasis on critical incidents which could indicate how a leader with a particular orientation is either effective or ineffective within a given situation.

All of the above criticisms indicate the need for additional research. As was assumed in this study however, the basic face and empirical validity of the Contingency model nonetheless, warrants its use in the investigation of the area of coaching leadership.

Theory and Measurement of Leadership in Coaching

While a great deal of research on leadership has been conducted by social psychologists since the Second World War, relatively little has been conducted in the specific area of coaching. Tutko and Richards (1971) have postulated five different classes of coaches, vis. Hard-nosed," "nice-guy," "easy-going," "driven" and "business-like." They essentially postulated two bipolar dimensions of coaching behavior, and one unipolar. One bipolar dimension is characterized by behaviors punitive to the athlete, rigid and impersonal in nature. The opposite end of this dimension is characterized by flexible behaviors centered around warm

interpersonal relationships and positive reinforcement for the athlete. The second bipolar dimension is characterized by on the one hand, nervous driving behaviors, and on the other by a seemingly unorganized, lazy approach to problems. The last dimension, which appears to be unrelated to the other two, is a behavior pattern showing extreme organization of practices and competitions.

While an approach stressing stereotypes has its advantages in simplification of understanding, it has the disadvantage of oversimplification of the complexity of human behavior--coaching being no exception. Hendry (1972) suggested that athletes interact with their coach in a stereotyped manner. He stated that he found that both the physical educator and the coach tended to be perceived similarly by the mass media, namely as a "muscular, extraverted, confident and social figure (p.41)," and that the social "persona" of the coach involved dominance, aggression, and authoritarianism. This would seem to suggest concomitant behavior patterns, either as causes or effects of the stereotype.

In a recent study conducted on 42 coaches of football and basketball teams in Edmonton, Canada, Bain (1973) found quite different results from Hendry. In terms of both general and right-wing authoritarianism, the coaches' group had the lowest scores when compared with two control groups of educators and a sample of the general male population.

Also, within the coaching group itself, younger coaches tended to score higher on authoritarianism than did older coaches.

In a study of 382 Canadian athletes representing 25 different sports and a wide range of age and skill categories, Percival (1971) extracted 25 'positive' coaching mannerisms and 15 'negative' mannerisms as seen by the athlete (Table 3). Percival's methods included interviews and opinionnaires and as he noted, findings produced by these methods give rise to questions concerning their replicability. Also, if they are replicable by other methods, it must be determined whether the behaviors described are generally observable characteristics of coaches, or only athletes' perceptions of their coaches.

Danielson, Zelhart and Drake (1973) administered a revised version of the LBDQ to 160 junior and senior high school hockey players who in turn evaluated their previous season's coaches. Using the top 57 most commonly cited behaviors, the authors found that factor analysis provided 20 unrelated dimensions while multidimensional scaling indicated 8 dimensions of commonly perceived coaching behaviors in hockey. Table 4 shows the eight dimensions of coaching behavior as identified in the scaling solution.

The above mentioned research in the specific area of coaching, when related to leadership theory, shows that relationships between the coach and the situation have been

generally ignored. It would therefore seem quite necessary

TABLE 4

MULTIDIMENSIONAL SCALING OF COMMONLY PERCEIVED COACHING BEHAVIORS

DIMENSION NAME	BEHAVIOR DESCRIPTION
1 COMPETITIVE TRAINING	- behavior concerned with motivation of athletes to train harder and better
2 INITIATION	- behaviors involving an open approach to problem solving using new methods - little emphasis on organization in the form of equipment provision
3 INTERPERSONAL TEAM OPERATION	- coordination of team members in an attempt to facilitate cooperation at possible expense of protocol - little emphasis on criticism of performance
4 SOCIAL	- socially oriented behavior outside the athletic situation - little emphasis on consistency of performance, organization or team morale
5 REPRESENTATION	- behaviors concerned with representing the team favorably in contacts with outsiders
6 ORGANIZED COMMUNICATION	- behaviors concerned with either organization or communication with no concern for interpersonal support
7 RECOGNITION	- behaviors concerned with feedback and reinforcement of both performance and team participation in decision-making
8 GENERAL EXCITEMENT	- arousing behaviors involving disorganized approach to team operation

to consider this variable in further research done in coaching.

TABLE 3

COACHING MANNERISMS OF CANADIAN COACHES*

NAME	TYPICAL COACHING BEHAVIOR
	NEGATIVE
INSULTER	criticizes the athlete whenever a mistake is made
SHOUTER	shouts during pep talks, instructions
AVENGER	withdraws privileges and administers punishment via hard practice after a loss
CHOKER	goes into shock during competition
TOUGH GUY	gives difficult practices, unsympathetic
MUMBLER	ineffective in giving instructions/motivation
MOLDER	rigid in adjusting techniques to athletes
GENERAL CUSTER	rigid in changing training methods,
SAD SAM	presents under-confident attitude in games
HERO	ostentatious in giving instructions, too much congratulating
CRITIC	looks for mistakes and is constantly negative
WHINER	sulks if mistakes are made, negative emotional appeal to athletes in losing situations
SLOPPY JOE	disorganized, never plans practices, no equipment
SCIENTIST	too much emphasis on high strategy, no fundamentals
HITLER	poor interpersonal interaction, rigid, dictating
FAST MOUTH	too many instructions, covers too much ground
BLISTER	poor interpersonally, organized but lazy
RAPPER	critical, sarcastic
BLACK CATTER	superstitious
ROCKNE	emphasis on inspiration talks, lack of mechanics
SUPER FRIEND	too much on interpersonal emphasis
JAILER	imposes unrealistic rules, too much control
WHITE CANE	poor mechanical knowledge, socially unaware
SULKER	withdraws and sulks when things go wrong
	POSITIVE
SUPPORTER	defends team publicly, not critical
MR. COOL	no criticism in public, calm and relaxed in games
THE SHRINK	effective interpersonally, reinforcing, but not critical
TOURIST	gives personal attention, treats members equally
COUNSELLOR	not critical or aggressive, helps athletes
THE DOCTOR	knowledgeable in health/hygiene matters
SALESMAN	organized, reinforcing, motivating
DEMOCRAT, ORATOR, APPRECIATOR, PLANNER, INSPIRER, WITH IT, ORGANIZER, EXPLAINER	

*from Percival, 1971: 298-322.

The Classification of Groups in Sport

One of the major considerations in any study on leadership is the interaction between the leader (personality, motivation, behavior), the group (number of members, structure of interpersonal relations, group goals) and the task with which the group is concerned. Groups in sport differ in many ways such as size of the group, type of sport, age of the team members, league (competitive) environment, nature of individual team members' interactions and team goals. It would therefore be desirable to examine the relationships between these group variables and the behavior of the coach.

In order to examine the questions formulated above, it is necessary to consider the question of classification of groups. Shaw (1971) noted that groups can be classed in terms of the following characteristics:

1. Perceptions and cognitions of group members,
2. Motivation and need satisfaction,
3. Group goals,
4. Group organization,
5. Interdependency of group members, and
6. Interaction (p.5)

He noted that the six approaches may not be independent, and emphasized that some authors studied group phenomena without an explicit definition of 'group'.

In sport research, some of these dimensions were used by various authors. For example, Cratty (1973) suggested that sport groups could be defined in terms of membership,

needs and interpersonal interaction. Membership refers to the formal structure of the team; that is whether or not team members are rigidly recruited and screened, and their places on the team held only as long as they conform to rigid rules regarding attendance at practices, adherance to game plans etc. At one extreme are recreational leagues in which team members may play for the team any number of times they desire. They can join the team at any point in the season and rejoin after any length of absence. At the other end of this dimension are professional sport teams in which aspiring players must attend all practices, play for the team throughout the entire season (or as long as they are able) and are generally not free to join the team once the season has begun.

The membership dimension described above is in partial accord with a recent suggestion by Smith (1973) that sport environments be categorized by participant objectives. He hypothesized four social environments resulting from differing goals of participants; namely recreation, competitive, sports excellence and professional sports. Membership as defined by Cratty, is similar to social environment as defined by Smith. An individual with a competitive or sports excellence goal, due to his orientation, may be expected to participate in a league with relatively rigid membership requirements, because he is prepared to meet the requirements set forth by the league. Another individual with recreative goals may be expected to

participate in a sport with unstructured membership requirements. It should be noted that there may be exceptions to this classification in cases where there are only low membership organizations available (e.g. Archery), or in cases where there are only relatively rigid membership organizations available in a particular sport (e.g. Rowing). Nonetheless, there appears to be in sport a dimension which, differs in the strictness of membership requirements imposed on athletes, either by virtue of individual goals or organizational structure.

The second dimension suggested by Cratty is a motivational dimension. This dimension is related to both the need satisfaction and group goal dimensions proposed by Shaw (1971). This dimension is theoretically important to work on leadership, however discussion of the dimension shall be left to the next section.

Cratty's final classification dimension is in terms of whether the group is coacting (e.g. Diving team), mixed coacting and interacting (e.g. Swimming relay team) or interacting (e.g. Hockey team). This dimension is related to how much interdependence or coordinated effort is required to reach the task goal of winning a competition or game. In coacting teams athletes perform individually to obtain a score which is then combined in some fashion with other athletes' scores to produce the team score. There is no strict interdependence among athletes. Interacting teams, on

the other hand, require a modicum of coordinated effort to perform. There must be compromise and cooperation in order for the team to function efficiently if at all. Between these two extremes there are sport teams which function in part as coacting units and in part as interacting units. A good example is a football team which is divided into offensive and defensive teams. The respective lines function as interacting units yet the composite unit (the entire team) functions as two coacting units. Another example is in the case of rowing in which an oarsman can function independently (coacting) or with others in two-, four- or eight-man boats (interacting). The point to be made here is that the situational demands of membership and interactional requirements, may place strong constraints upon the behavioral and motivational aspects of coaching which will be effective and appropriate in that circumstance.

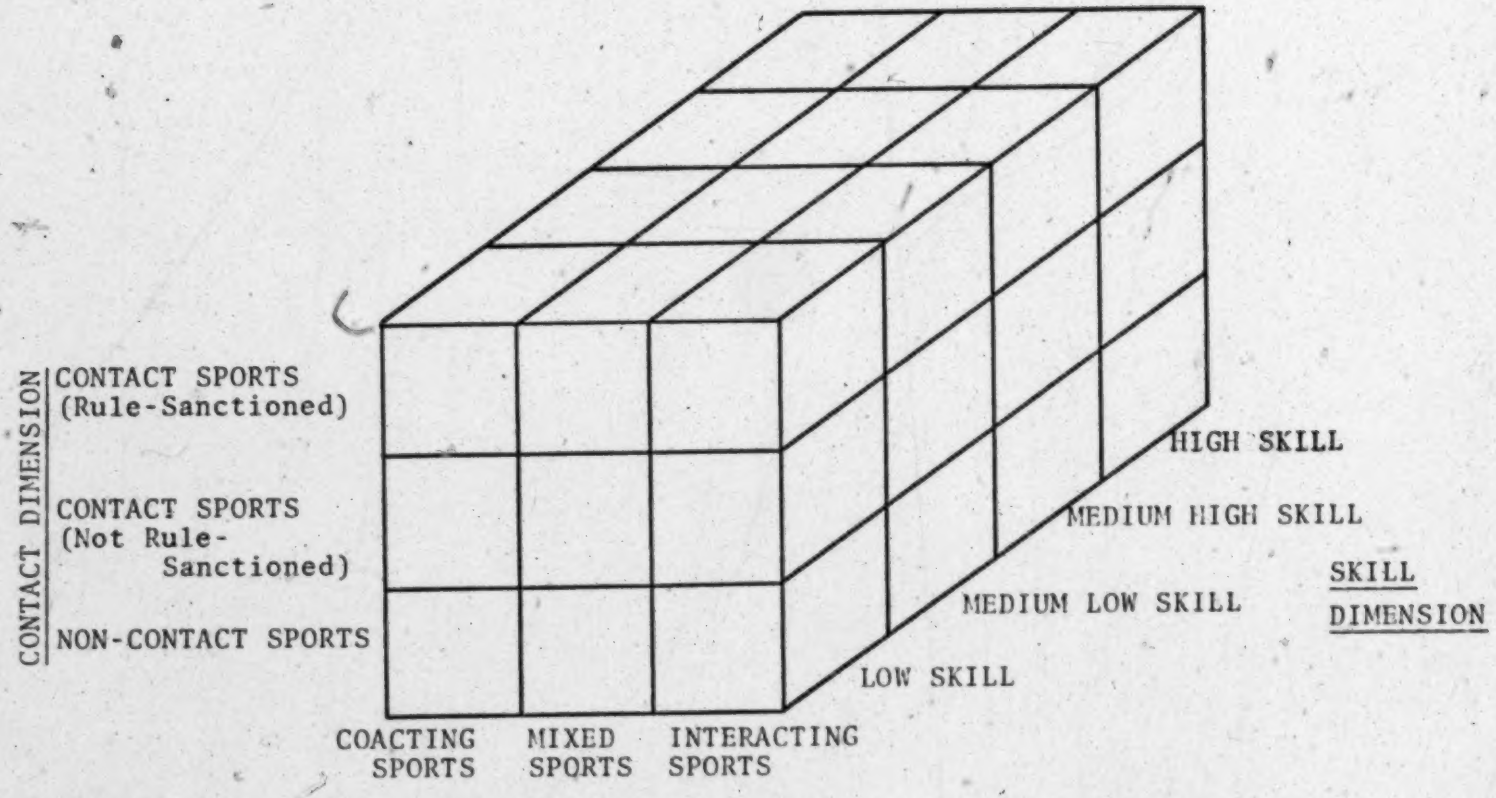
One final dimension along which sports vary, is an organizational one relating to physical contact. Some sports such as field events, diving, golf, gymnastics, rowing, swimming and volleyball involve no physical contact at all between competing athletes. Others such as boxing, wrestling, fencing, judo, football, hockey and rugby allow contact. Still others (e.g. Baseball, cricket, basketball and soccer), because of their nature, give provisional sanction to contact. However they do not fully sanction the contact, and impose penalties for infractions of this rule.

It can be seen that there are certain organizational constraints placed upon sports which can be used to classify them. The three dimensions mentioned above - membership, interaction and contact - do not change or change very slowly over time. They are relatively unalterable dimensions which possibly select both athletes and coaches for participation in the sport. It is possible to presume that individual differences in coaching behaviors, temperamental traits and motivation will be found along these dimensions, along with already established individual differences in physical compositions, personality traits and motivations of athletes. It could also be argued that the kind of sport as indicated by its position on the three dimensions is related to the determination of these differences. Thus if differences in any of the above variables are observed it could then be postulated that these differences are an important function of the organizational requirements of the sport.

Figure 2 shows an orthogonal representation of the three dimensions, with skill substituted in the place of membership. This was done primarily on the basis of ease of classification. Results obtained along this dimension would appear to be similar to those obtained along a membership dimension. It can be observed that due to different skill requirements, a given sport can be represented in more than one cell. It may be possible that in terms of effective leadership, different variables could become important by

FIGURE 2

A CLASSIFICATION OF GROUPS IN SPORT



Comparing sports on any one or more dimensions.

While the preceding discussion is not directly related to the present study, it does offer some suggestions as to research directions in leadership research on sport groups. Here, attention was focussed on an interacting contact sport (hockey) over two skill levels (BB vs AA),

Group Tasks, Goals and Classification

Prior to discussing the problem of group goals, the relationship between the task of the group and the goal of the group must be clarified. As was mentioned in the section on leadership, structure of the task is an element in the definition of situation favorableness for the leader as used by Fiedler.

Shaw (1971) defined the group task as that which "...must be done in order for the group to achieve its goal or subgoal (p.300)." In other words, the task itself may be termed a subgoal or the goal itself. It is now necessary to address the concept of 'group goal', because it is involved in the definition of siutation favorableness as outlined in Fiedler's theory.

Cartwright and Zander (1953:308-313) propose four conceptualizations of group goals:

1. Composite of similar individual goals - either as an additive sum of individual goals or as a composite of shared individual goals. The main problem here is that a group goal may exist when there is no apparent

similarity between individual goals of members.
2. Composite of individual goals for the group - some combination of what members feel is the goal of the group. But this is limited to conscious goals and does not specify the form or combination of individual goals (for example unanimity versus majority).
3. Interrelation between motivational systems of individuals - the actions of one or more members result in need satisfaction of others. However this does not specify the method of selection of the group goal nor how the goal steers the activities of the group.
4. Inducing agent - members are influenced by the group goal even though it is not alike their own goals for the group. "A satisfactory conception of a group goal must recognize that a group goal can induce motivational forces upon members and that the magnitude of such influence can vary quantitatively among goals and among members (p.311)."

The authors concluded that a combination of viewpoints 3 and 4 appeared to have the most promise for a satisfactory conceptualization of the concept of group goal. In a later consideration of this problem (Cartwright and Zander, 1960) they emphasized the advantage of treating the concept 'group goal' as functionally equivalent to the concept 'individual goal'. In other words, it is more advantageous to consider the group goal to be somewhat apart from individual goals although it is determined by individual goals for the group.

Shaw (1971) concurred partially with the views of Cartwright and Zander (1953,1960) when he stated that "group goals probably are best regarded as some composite of individual goals, despite the difficulties associated with such a conception (p.293)." Group goals therefore, can be conceptualized in various fashions. In the present work it was assumed that group goal is synonomous with the sum of individual goals for the group.

Returning again to the problem of task, there are three approaches which can be taken to classify task environment. They are "...1. The development of a standard group task; 2. The classification of tasks into specific categories (a typology of tasks); and 3. The dimensional analysis of group tasks (Shaw,1971:301)." Virtually all field research in sport situations precludes the use of a standardized group task and it is not easily possible to apply standard sociopsychological task typologies to differentiate among sports.

Carter, Haythorne and Howarth (1950) identified six types of tasks namely clerical, discussion, intellectual construction, mechanical assembly, motor coordination and reasoning. It would seem on the basis of this typology that sport tasks in the main, would fall into the motor coordination type. Thus this approach would not help in classifying tasks (sports) within the sport domain.

Thibault and Kelley (1959) proposed a scheme in which tasks vary with respect to state, requirements and correspondence. State refers to the variation of input stimuli over time and may thus be steady or variable. Requirements of a task may be conjunctive in which a combination of group members must make the required response for successful completion, or disjunctive in which <u>any</u> member can make the required response. The final dimension refers to whether the outcomes are available to more than

one member at a time (correspondence), or whether outcomes available to one person do not correspond to outcomes to another (noncorrespondence). While this theory has more face validity pertaining to use in sport situations, there are still problems. For example, with the last dimension it is difficult to determine whether in sport the outcomes available to one member are in fact available to all members (correspondence vs no correspondence).

One of the three variables used by Fiedler (1967) to determine situational favorableness for the leader, was task structure. His operational measure of this variable was expert ratings of many tasks on the basis of four criteria: decision verifiability, goal clarity, goal path multiplicity and solution specificity. These dimensions were adopted from a task classification by Shaw referred to as 'dimensional analysis' (Shaw 1971: 308-313). Fiedler's use of Shaw's dimensions would seem to be an attempt to choose easily operationalizable dimensions with considerable face validity, and which could be used with a variety of groups. It would seem then in dealing specifically with sport situations, that licence could be taken to adopt the same procedure.

In the present work, only the single variable of goal clarity as perceived by the team was used as a measure of the structure of the task. This variable, as was indicated above, was operationalized as the group mean of the

individual team members' perceptions of the clarity of the group's goals.

CHAPTER III

METHODOLOGY AND EXPERIMENTAL DESIGN

Subjects

The coaches and athletes from 40 teams representing Bantam BB, Bantam AA, Midget BB and Midget AA in the city of Edmonton served as subjects in the study. The original sample consisted of 48 teams and was subsequently cut to 40 due to the withdrawal of two teams from each of the Bantam BB and Midget BB leagues. Two teams from each of the other two leagues were dropped to keep the team numbers equal in all four leagues.

Test Apparatus

1. Coach Behavior Description Questionnaire (CBDQ). This instrument is designed to provide information on the frequency with which coaches exhibit behavior patterns as perceived by athletes. Five dimensions are scored, vis. Teaching, Consideration, Initiation, Pressure, and Representation (Danielson et al, 1974), and subscale reliabilities in Table 17. Scale descriptions are given in Appendix 4.

2. Dalhousie Coach Observation Schedule (DCOS). This is a behavioral scale giving scores on 7 categories of observable behavior vis. Feedback-reward, correcting-prohibiting, questioning, directing-explaining-informing, monitoring-

attending, managing and no activity (Rushall, 1973). Scale descriptions are given in Appendix 6, and inter-observer percentage of agreement in Figure 7.

3. Least-Preferred Coworker Scale (LPC). This is a motivational instrument designed to provide information regarding the primary motivational style of leaders. High scores relative to the norm group indicate a person-oriented motivational style and low scores indicate a task-oriented style of leadership (Fiedler, 1967). The scale, as used in this study, is given in Appendix 7.

4. Team Atmosphere scale (TA). This is a ten-item bipolar adjective checklist designed to indicate a leader's perception of the situation within which he is working. Low scores relative to the norm group indicate relatively unfavorable leader-member relations (therefore unfavorable situations), and high scores the opposite (Fiedler 1967). The scale, as used in this study, is given in Appendix 7.

5. Learning Environment Inventory (LEI). This is a questionnaire designed for administration to school classes (Anderson, 1973). A modification of this instrument for use in sport situations was used in the present study. Fifteen subscales provide information as to how athletes perceive the team environment. The subscales are cohesiveness, diversity, formality, speed, environment, friction, goal direction, favoritism, cliqueness, satisfaction, disorganization, difficulty, apathy, democratic and competitiveness. Scale descriptions are given in Appendix 5.

Methodology

Testing was done on a group basis - usually conducted in the change room after a parctice or game. An attempt was made to follow-up on subjects not present at the group session, by giving test instructions to these individuals in their homes and allowing them to mail back the completed questionnaires.

Due to the unavoidable limitations of time and/or facilities, two teams were tested by giving test instructions in the change room and allowing the players to complete the questionnaires at home. In two other cases, due again to scheduling problems, the entire teams were tested individually in their homes.

Using the above procedures 506 players were tested from the 40 teams. This figure represented 81.5% of the 619 individuals on the teams. A detailed presentation of the number of players tested on individual teams is given in Appendix 1, along with the number of players in each team completing the LEI and the number completing the CBDQ. Subjects in each team were randomly assigned to either the LEI group or the CBDQ group so that one half of the subjects in each team completed each questionnaire. The half-team score was assumed to be an accurate approximation of the whole team score. Within the two groups 253 completed the LEI and 253 completed the CBDQ.

In order to obtain the description of coaching behavior, the question was considered from two points of view, namely that of the athletes and that of an independent observer. One-half of the athletes of each respective team sampled, were administered the CBDQ as outlined by Danielson et al (1974). The other half of the team was administered the LEI as outlined by Anderson (1973) and modified for use in this study. This instrument was more concerned with perceived team phenomena rather than specific perceived coaching phenomena and was considered to be complementary to the CBDQ. In both questionnaires, players were required to indicate whether they strongly disagreed, disagreed, agreed or strongly agreed with the item.

As well as the above, the coaches of all teams in the playoffs were observed using the Dalhousie Coach Observation Schedule (DCOS). This instrument was included so as to cross validate findings obtained from perceived behavior and perceived team environment, with observed behavior. In total, 11 coaches were observed in practices and 18 coaches were observed in games.

Finally, the standard demographic data of age, socioeconomic standing, number of years playing experience and number of years coaching experience were collected from the coaches and age, SES and playing experience from the athletes.

For the athletes, age, socioeconomic standing (SES) and playing experience were measured so as to determine the possible effect of these variables in subsequent analyses. SES was determined using the Blishen (1967) Scale. This instrument is based on the distribution of education and income, and provides a scalar number incidating the respondent's social standing as determined by these two variables. The Blishen scale was chosen for this study due to the fact that it was developed for use within a Canadian context.

As well as age, SES and playing experience, number of years coaching experience was also collected from the coaches. Once again the reason for inclusion was the possible influence of these variables on either observed or perceived coaching behavior. In addition to this reason however, the variables were included for classification purposes in the descriptive aspect of the study.

When using Fiedler's model in the evaluation of coaching effectiveness, the following data must be provided: motivation of the leader, task structure, position power and coach-athlete relations. As well, a criterion must be provided against which to compare coaching effectiveness. In the present study only the situational variables of task structure and coach-athlete relationships were used; position power was not included. The reason for the

exclusion of this variable was that as measured by Fiedler, it had no face validity in coaching situations. This does not argue that the variable is of no use. Rather it argues for a reconceptualization of position power as it could apply in coaching, and construction of a more valid instrument.

Motivation of the leader was established through use of the Least Preferred Coworker (LPC) scale. All coaches in the sample were administered this scale. In addition, the coaches were administered Fiedler's Group Atmosphere scale (Fiedler,1967) so as to provide an evaluation of the coach-athlete relationships from the coach's point of view. Appendix 7 shows the LPC and TA scales along with accompanying instructions.

Statistical Treatment of the Data

Specific hypotheses tested in the present study are presented below with analysis technique rationale and statistical treatment of collected data following:

1. There are no relationships among the coaching variables of age, socioeconomic status, playing experience, coaching experience and motivation (LPC).

Analysis

- R technique factor analysis with subsequent varimax rotation.
- calculation of factor scores.

- rationale: The model used was incomplete principal composent analysis (Harman, 1968) due to the exploratory nature of the hypothesis.

2. There is no relationship between level of competition and dimensions of coaching classification as derived from analysis 1.

Analysis

- analysis of variance on factor scores for all coaches
- one analysis of variance for each factor score.

3. There is no relationship between perceived coaching behavior (CBDQ) and perceived team environment (LEI).

Analysis

- factor analysis of group scores on CBDQ and LEI
- extraction of factor scores.
- rationale: Again due to the nature of the question (exploration versus confirmation), incomplete principal component analysis was used.

4. There are no relationships among dimensions of coaching classification derived in analysis 1 and factor scores of player perception derived in analysis 3.

Analysis

- factor analysis of factor scores of coaching classification (analysis 1) and factor scores of player perception (analysis 3).

5. There is no relationship between coach-athlete relations (TA) as perceived by the coach and as perceived by the athletes (CBDQ,LEI).

Analysis

- analysis of variance on teams with good vs poor coach-athlete relations as perceived by the coach.
- 40 teams divided at median of TA score
- one analysis per variable of player perception.

6. There are no relationships among dimensions of observed coaching behavior (DCOS) in game and practice situations.

Analysis

- two Pearson correlation analyses of coaches' frequencies of observed behavior as seen in game and practice DCOS data.

7. There are no relationships between coaching behavior observed in game situations and the same behavior observed in practice situations.

Analysis

- correlation analysis of raw DCOS scores for coaches in game and practice situations

8. There is no relationship between coaching as perceived by athletes (CBDQ,LEI) and percentage win-loss ratio.

Analysis

- one-way analysis of variance on winning vs losing teams against factor scores obtained in analysis 3.

9. There is no relationship between dimensions of coaching classification indicated in analysis 1, situational favorableness for leadership (TA scale, goal direction scale-LEI) and win-loss.

Analysis

- correlation analysis between the variables and win-loss ratio at each level of situation favorableness.

10. There is no relationship between observed coaching behavior (DCOS) and win-loss ratio.

Analysis

- Pearson product-moment correlation analysis between game and practice DCOS categories and win-loss ratio.

CHAPTER IV

RESULTS AND DISCUSSION

Due to the large number of hypotheses, results and discussions will be grouped into sections, each section being internally consistent and containing one or more of the aforementioned hypotheses.

Team Data

So as to test the possibility that any league was over- or under-represented in players, a one-way analysis of variance was conducted on the percentage of total players actually tested on each team. Four groups were compared - Bantam-BB (B-BB), Bantam-AA (B-AA), Midget-BB (M-BB) and Midget-AA (M-AA). The unit of analysis was the percentage of total team members that were actually tested. Table 5 shows results of this analysis.

Similar results to those shown in Table 5 were found on analyses performed using either total numbers of players per team or number of players per team who were actually tested. Therefore, the team representation, as indicated by percentage of total possible team members who were actually tested, was high and not significantly different within the four leagues.

In order to test the possibility that age, skill or

TABLE 5

ANALYSIS OF VARIANCE SUMMARY TABLE
FOR TEAM REPRESENTATION (PERCENTAGE)

Source of Variation	SS	df	MS	F
Leagues	342.97	3	114.32	0.64
Error	6467.05	36	179.64	
Total	6810.02	39		

*denotes significance at .05 level

socioeconomic status (SES) variables could have been disproportionately represented in any of the four leagues, variance analyses were performed on these three variables. Once again, the unit of analysis was the team score. Players' scores on each of the three variables were averaged over the entire team and these scores were included in the analyses.

Table 6 shows the results of a two-factor analysis of variance with 10 teams per condition. The variable measured was age in years.

In this analysis, as with the analyses on SES and playing experience, skill (i.e. BB vs AA teams) and age (i.e. Bantam vs Midget teams) were classed as the two fixed factors. Sums of squares for teams were pooled along with interaction effects among teams and the other two variables to form the error term for all cases.

Results in Table 6 show that as expected, average team

TABLE 6

ANALYSIS OF VARIANCE SUMMARY TABLE FOR AVERAGE TEAM AGE

Source of Variation	SS	df	MS	F
Skill (BB-AA)	0.477	1	0.477	6.48+
Age (B-M)	36.424	1	36.424	494.46+
SkillxAge	0.044	1	0.044	0.60
Error	2.652	36	0.074	
Total	39.597	39		

+denotes significance at .01 level

age in bantam teams was significantly less than that in midget teams. This result would be expected as a result of the age restrictions in registration. Mean team ages were 13.87 and 15.77 years respectively. Also significant was the finding that the AA teams had average player ages which were significantly greater than BB teams (14.93 years vs 14.71 years). The difference was slight but significant and did not vary between the bantams and the midgets as indicated by a non-significant interaction effect. This finding would appear to be due to the fact that the AA leagues, being more competitive than the BB, would tend to select older and more physically developed players.

The analysis performed on SES showed that there were no significant differences between team averages comparing across bantams and midgets or BB and AA teams. Similarly, the interaction effect was non-significant. This suggested that the sampling technique was effective in producing four samples from similar socioeconomic classes. Average SES for

the entire sample was 45.67 on the Blishen scale (Blishen,1967). Table 7 gives summary data for this analysis.

In terms of playing experience the midget leagues once

TABLE 7

ANALYSIS OF VARIANCE SUMMARY TABLE FOR AVERAGE TEAM SES

Source of Variation	SS	df	MS	F
Skill (BB-AA)	68.276	1	68.276	1.68
Age (B-A)	1.023	1	1.023	0.03
SkillxAge	8.968	1	8.968	0.22
Error	1459.00	36	40.527	
Total	1537.267	39		

*denotes significance at .05 level

again had significantly more experience than the bantam leagues (7.03 years vs 5.72 years). Similarly, the AA leagues were composed of teams with significantly greater average playing experience than the BB leagues (7.28 years vs 5.47 years). However, as in the analysis on age, there was no significant interaction effect indicating that the trend was similar for teams in both the bantam and midget leagues. The summary for this analysis is given in Table 8.

Individual team averages as well as league averages on the variables of team age, team SES and team playing experience are given in Appendix 2.

Coaches' Data

TABLE 8

ANALYSIS OF VARIANCE SUMMARY TABLE FOR AVERAGE TEAM PLAYING EXPERIENCE

Source of Variation	SS	df	MS	F
Skill (BB-AA)	32.942	1	32.942	27.15+
Age (B-M)	17.03	1	17.03	14.04+
SkillxAge	0.697	1	0.697	0.57
Error	43.680	36	1.213	
Total	94.349	39		

+denotes significance at .01 level

As indicated previously, age, SES, playing experience, coaching experience, LPC scores and TA scores were obtained from all coaches participating in the study. So as to facilitate interpretation of the 10 hypotheses stated in chapter 3, similar analyses to those performed on the players, were also performed on the coaches' variables.

Age of the entire sample of 40 coaches was 33.35 years, S.D. 7.07 years. Coaches in the two bantam leagues did not differ singificantly in age from coaches in the two midget leagues; nor did AA league coaches differ in age from BB league coaches. The additional absence of a significant interaction effect suggested that coaches' ages within the four leagues sampled were relatively homogeneous. Table 9 presents this summary.

Similar results to the age analysis were found in the SES analysis. While the grand mean for all coaches was 46.39 (S.D. 13.45) on the Blishen scale, there were no significant

TABLE 9

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' AGES

Source of Variation	SS	df	MS	F
Skill (BB-AA)	84.100	1	84.100	1.69
Age (B-M)	67.600	1	67.600	1.37
SkillxAge	14.400	1	14.400	0.29
Error	1783.00	36	49.528	
Total	1949.100	39		

*denotes significance at .05 level

differences between coaches in BB and AA leagues or between coaches in bantam and midget leagues. As well, there was no interaction effect. A comparison between the average SES of players and the average SES of coaches showed a difference of less than one scale unit. Results for the coaches are shown in Table 10.

Coaches among the four leagues differed significantly

TABLE 10

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' SES

Source of Variation	SS	df	MS	F
Skill (BB-AA)	59.145	1	59.145	0.31
Age-M)	73.550	1	73.550	0.38
SkillxAge	29.894	1	29.894	0.16
Error	6895.10	36	191.530	
Total	7057.677	39		

*denotes significance at .05 level

in the amount of playing experience. Means for all four groups were as follows:

B-BB - 4.00 years S.D. 5.59

B-AA - 11.9 years S.D. 7.85

M-BB - 9.00 years S.D. 5.43

M-AA - 8.90 years S.D. 4.28

The same results are shown graphically in Figure 3. The high value for the B-AA group was due primarily to three individuals having playing experience of 18, 24 and 25 years respectively. While this is possible it seems also possible for the results for the 3 coaches to be spurious. The B-AA result contrasted markedly with the B-BB league in which 6 coaches indicated that they had not had <u>any</u> hockey playing experience. In terms of the analysis, coaches in the AA leagues had significantly more playing experience than coaches in the BB leagues (10.40 years vs 6.50 years) and the interaction was significant as indicated above. Average playing experience for all coaches was 8.45 years with S.D. 6.38 years. Table 11 shows the summary for this analysis.

TABLE 11

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' PLAYING EXPERIENCE

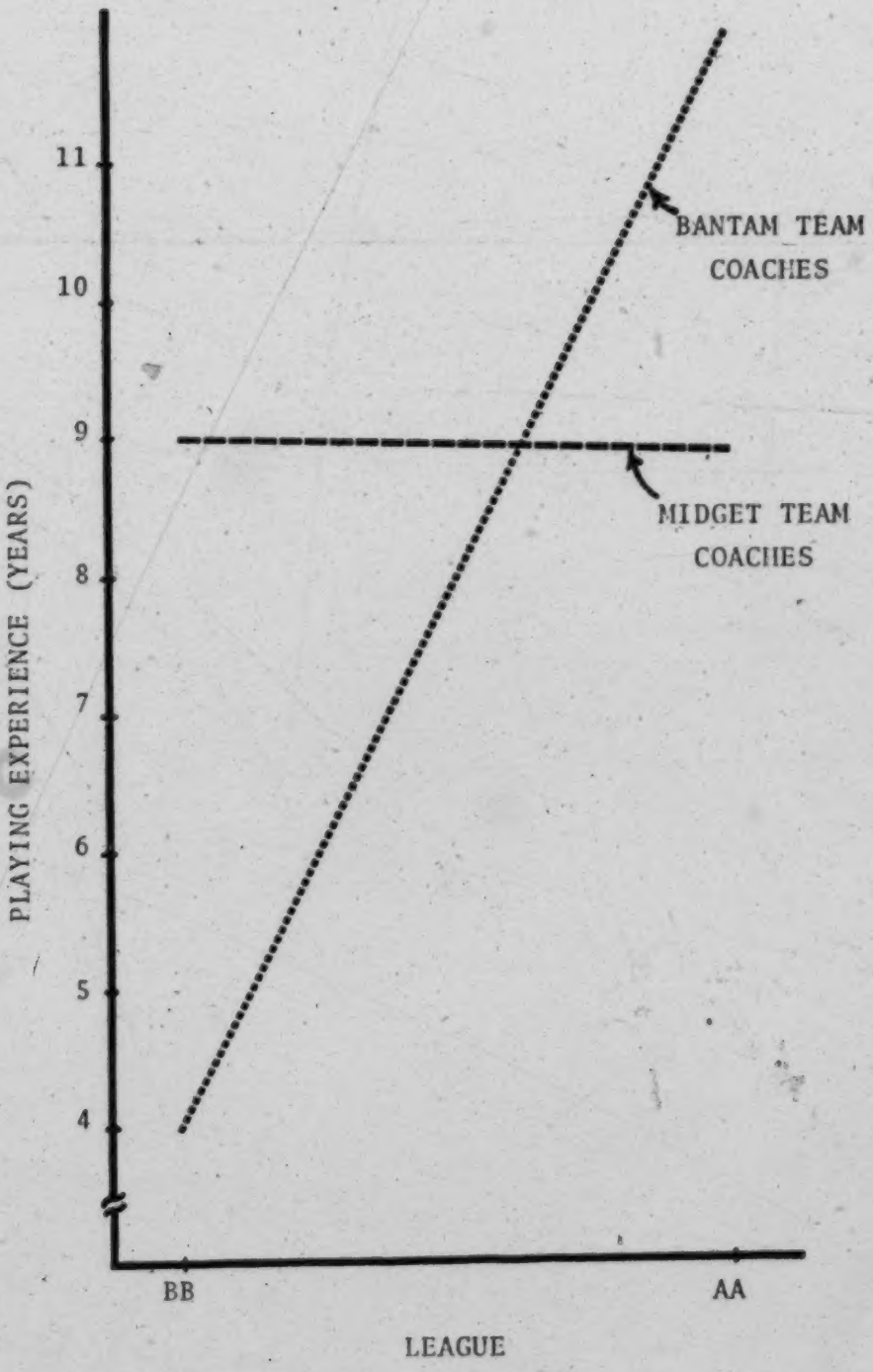
Source of Variation	SS	df	MS	F
Skill (BB-AA)	152.10	1	152.10	4.32*
Age (B-M)	10.00	1	10.00	0.28
SkillxAge	160.00	1	160.00	4.54*
Error	1267.8	36		
Total	1589.90	39		

*denotes significance at .05 level

It is perhaps an exemplary feature of Canada's minor hockey system that over half of the coaches in the B-BB

FIGURE 3

COACHES' PLAYING EXPERIENCE (N=40)



League could be enticed to coach despite the fact that they had not had any previous hockey playing experience. This finding argues strongly for more coaching courses which could give coaches more information about their sport.

Similar to the differences found in playing experience of coaches in the four leagues, differences were also found in terms of coaching experience. While average coaching experience of all coaches was 5.30 years (S.D. 3.92), coaches in AA leagues had significantly more experience than coaches in BB leagues (6.5 years S.D. 3.17, vs 4.1 years S.D. 4.29). The trend was constant over both bantam and midget leagues as indicated by a non-significant interaction effect. Coaches of bantam teams did not differ significantly from coaches of midget teams in terms of coaching experience. Table 12 shows the summary.

No significant differences were found between coaches

TABLE 12

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' COACHING EXPERIENCE

Source of Variation	SS	df	MS	F
Skill (BB-AA)	57.600	1	57.600	4.14*
Age (B-M)	16.900	1	16.900	1.21
SkillxAge	22.500	1	22.500	1.62
Error	501.40	36	13.928	
Total	598.400	39		

*denotes significance at .05 level

of BB vs AA leagues or bantam vs midget leagues in terms

score on the LPC variable. As well, the interaction effect was non-significant. The grand mean LPC score was 69.90 with S.D. 15.73. Table 13 summarizes the analysis of variance on the LPC scores.

The final analysis performed on the coaches' personal

TABLE 13

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' LPC SCORES

Source of Variation	SS	df	MS	F
Skill (BB-AA)	122.50	1	122.50	0.47
Age (B-M)	1.600	1	1.600	0.01
SkillxAge	122.50	1	122.50	0.47
Error	9409.00	36	261.36	
Total	9655.60	39		

*denotes significance at .05 level

data was that on perceived coach-athlete relationships as indicated by the Team Atmosphere (TA) score (Table 14). As seen in the analysis on LPC scores, there were no main effects due to the two factors, nor any significant interaction effect. The mean TA score for all coaches was 62.35 with S.D 11.89, again suggesting that with such a spread of scores, this variable along with LPC varies widely across the bantam and midget hockey coach domain. Table 14 shows the summary of the analysis.

It is appropriate to note at this point, that operating on the basis on the sport classification system shown in Figure 2, there are significant differences seen in both athletes and coaches between the two cells of low versus

TABLE 14

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' TA SCORES

Source of Variation	SS	df	MS	F
Skill (BB-AA)	230.40	1	230.40	1.58
Age (B-M)	36.10	1	36.10	0.62
SkillxAge	0.400	1	0.400	0.00
Error	5242.20	36	145.620	
Total	5509.10	39		

*denotes significance at .05 level

medium low skill. As far as athletes are concerned, more highly skilled athletes are seen to be significantly older than less highly skilled athletes. This gives some validity to the contention that the skill dimension in Figure 2 correlates with increasing age. In terms of coaches of more versus less highly skilled athletes, the former were seen to have had both more playing experience and more coaching experience. They did not differ as a group from coaches of less-highly skilled athletes, in terms of LPC or TA. Whether these results would be found between coaches and athletes representing the medium high skill and high skill cells, remains to be explored. Also unanswered, remains the question as to whether the same differences observed above, would be found along either or both of the other 2 dimensions in Figure 2.

Raw data for the above six analyses are presented in Appendix 3. Attention will now be focussed on hypotheses 1 through 10 as outlined in chapter three.

Dimensions of Coaching Classification

The first hypothesis stated that there were no relationships among the personal coaching variables of age, SES, playing experience, coaching experience and LPC scores. In order to test this hypothesis, an incomplete principal component factor analysis (Harman, 1968) was performed on a correlation matrix of the 5 variables. Only one correlation was found to be significant at the .05 level, namely that between coaches' ages and coaching experience (.377). This correlation, while significant, is rather low and suggests caution in interpretation.

Using the Guttman criterion of retaining for rotation

TABLE 15

FACTOR STRUCTURE MATRIX OF COACHES' PERSONAL DATA

Variable	Comm.	Factor 1 EXPERIENCE	Factor 2 PLAYING EXPERIENCE	Factor 3 MOTIVATION
Age	0.628	0.769	-.189	0.034
SES	0.268	-.327	0.375	-.143
Playing Experience	0.861	0.073	0.922	0.081
Coaching Experience	0.698	0.817	0.150	-.092
LPC	0.970	-.027	0.008	0.984
Total	3.426	1.372	1.048	1.005

only those factors with eigenvalues greater than one (Mulaik, 1972: 176), the three factors in Table 15 were

obtained. The amount of total accounted variance was 68.5%.

It can be noted that factor 1 is described by loadings of the variables of age and coaching experience, hence the name Experience. Slightly loading on this factor as well, is the SES variable. This suggests that coaches of increasing age and experience, also tend to fall slightly lower on the socioeconomic scale.

Factor 2 is called Playing Experience due to the high loading of that variable. Once again SES was involved, having a low positive loading. This suggested that this variable is related to the pursuance of hockey as a recreative activity in later life.

The final factor was called Motivation due to the sole high loading of LPC. This finding, along with that of the generally low loadings of SES on any of the three factors suggested that there may be three ways of classifying hockey coaches--in terms of their coaching experience, their motivation as indicated by LPC score and their playing experience. The question which naturally arises is whether or not these unrelated dimensions are found to be equally related to the different leagues as defined in this study (hypothesis 2).

In an attempt to test this hypothesis, factor scores on the three factors were calculated for all 40 coaches in the sample (Mulaik, 1972: 321-331). Three two-factor analyses of

variance were performed using the factor scores as the unit of analysis.

The analysis on the experience factor showed no significant differences on either of the main or the interaction effects. The coaches of AA teams had, as was seen in the analysis on coaching experience, slightly more experience as measured by factor 1 than did coaches of BB teams. This result was probably strongly influenced by the large main effect shown in Table 12. At any rate the results at this level as opposed to raw scores tend to suggest that the differences among the four leagues are not significant. Table 16 shows the summary.

Analyses on both the factors of playing experience and

TABLE 16

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACHES' FACTOR 1 - EXPERIENCE

Source of Variation	SS	df	MS	F
Skill (BB-AA)	395.86	1	395.86	4.017
Age (B-M)	0.974	1	0.974	0.009
SkillxAge	55.675	1	55.675	0.565
Error	3547.5	36	98.542	
Total	4000.009	39		

*denotes significance at .05 level

motivation were similar to those summarized in Tables 11 and 13 and will thus not be reported here. Therefore, with regard to hypothesis 2 it must be concluded that there is no

relationship between level of competition and either LPC score, experience or playing experience.

Coach Behavior Description Questionnaire (CBDQ)

As mentioned in Chapter 3, this instrument was designed to indicate the extent to which athletes perceive their coaches as having particular behavioral tendencies. Five scales are included, each containing nine items related to particular coaching objectives. Scale 1 refers to behaviors designed to give the athlete an educational experience in sport, hence it is called Teaching. Scale 2 refers to what Halpin and Winer (1957) designated as consideration behaviors, hence the name Consideration. Scale 3 is again compatible with Halpin and Winer's factor of Initiation of Structure, therefore it too is termed Initiation. One of the repeatedly common behavioral styles seen in coaches is that of criticism vs reward or pressuring athletes to better performances. Scale 4 contains behaviors centered around this concept and it is therefore called Pressure. The last scale is called Representation and refers to a behavioral style in which the coach acts on behalf of the team in dealings with outsiders. Appendix 4 gives items on each of the five scales along with scale interpretations, and Appendix 8 gives average team subscale scores for the five scales.

So as to examine the homogeneity of the 5 scales as

used in the present study, an item analysis was performed. Table 17 shows the results of the present analysis, along with the results obtained in the construction of the questionnaire (Danielson, et al 1974).

In order to examine the possibility that athletes in

TABLE 17

ITEM ANALYSIS OF THE CBDQ

Scale Name	Alpha Original	Alpha Present	Difference
Teaching	.74	.75	+.01
Consideration	.71	.67	-.04
Initiation	.78	.79	+.01
Task	.56	.49	-.07
Representation	.59	.62	+.03
Average	.68	.66	

teams of different leagues perceive their coaches differently, a discriminant analysis (Tatsuoka, 1970) was performed using each of the 4 leagues as criteria and the scores on the 5 scales as predictors. Results of this analysis showed that no one CBDQ scale score profile differentiated among the four leagues.

Bantam teams were compared with midget teams. Results again were non-significant suggesting that generally speaking, coaches of bantam teams are perceived similarly to coaches of midget teams.

A comparison was made between BB teams and AA teams. Results from this analysis showed that players of differing

TABLE 18

DISCRIMINANT ANALYSIS SUMMARY TABLE FOR BB vs AA TEAMS ON THE CBDQ

Scale Name	Scale Wt.	One-Way F	Discriminant F
Teaching	-1.20	0.896	
Consideration	-7.54	0.203	
Initiation	6.25	3.335	
Pressure	8.65	4.79*	
Representation	7.46	1.69	
			1.34

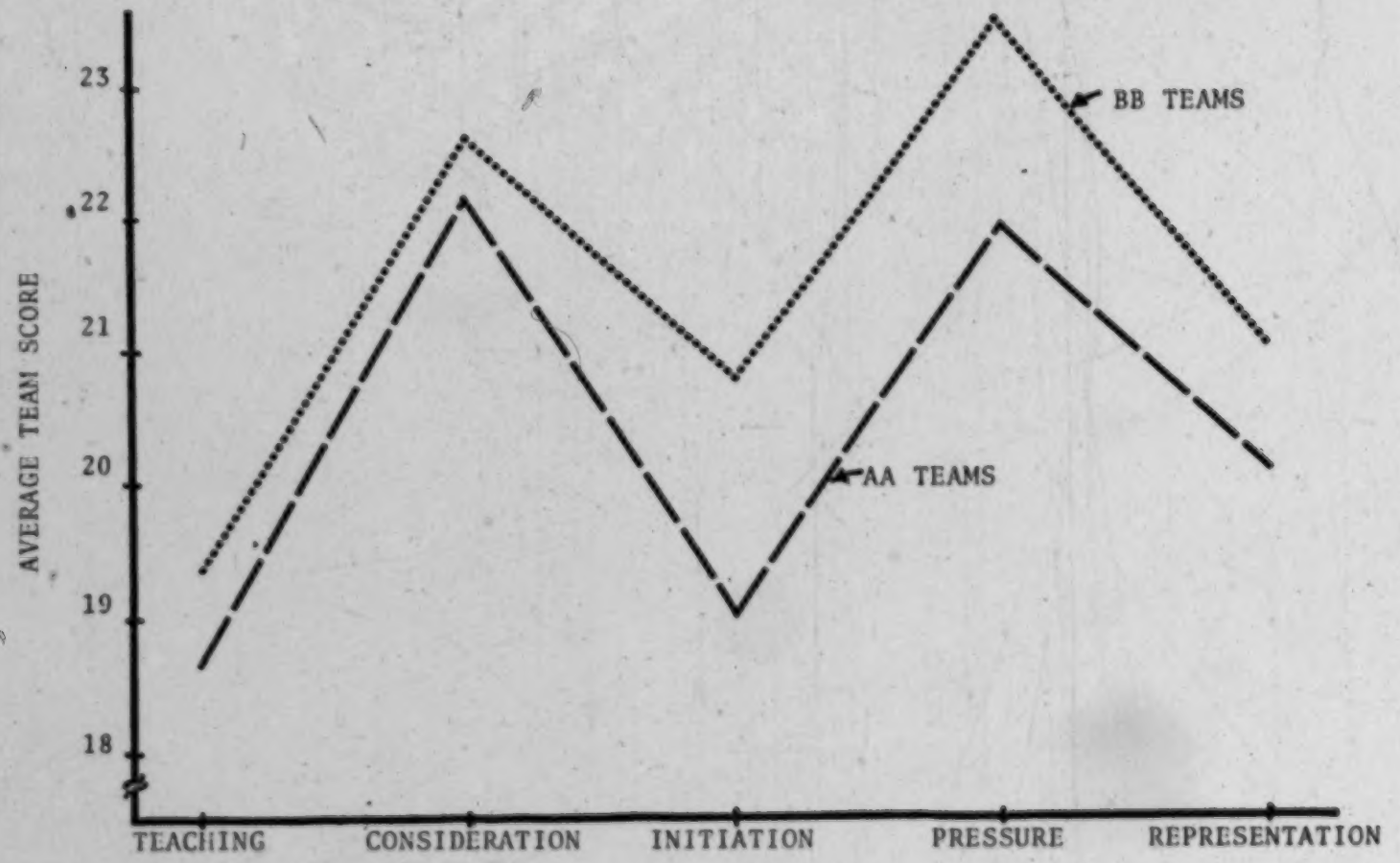
*denotes significance at .05 level

levels of skill did not perceive their coaches differently. As can be seen in Figure 4, BB players tended to perceive their coaches as indicating slightly more extreme behavior in all five scales.

Table 18 shows the scale weights and the F value for the total analysis along with F values for one-way analysis of variance performed between the two groups on each scale separately. The only scale showing a significant difference between the two leagues was the Pressure scale. BB teams tended to perceive their coaches as being more critical and pressuring than did players in AA teams. The reason for this could be due to AA-BB personality differences, skill differences, actual coaching differences or some combination of the 3 reasons. While the reason cannot be identified at this point, it provides a starting point for further research.

Learning Environment Inventory (LEI)

FIGURE 4 COACH BEHAVIOR DESCRIPTION QUESTIONNAIRE - BB vs AA TEAMS



The 15 scales along with their items and scale descriptions are shown in Appendix 5, and individual team averages on the scales in Appendix 9. The items have been modified so as to apply to sport situations. As, however, this instrument has not been previously used on sport teams, an item analysis was performed to compare scale homogeneities found in the present study against those found by Anderson (1973: 6-8). Table 19 shows the reliabilities as found in the 2 different environments.

Three of the scales were found to have extremely low

TABLE 19

ITEM ANALYSIS OF THE LEI

Scale Name	Alpha* Original	Alpha Present	Difference
Cohesiveness	.69	.61	-.08
Diversity	.54	.38	-.16
Formality	.76	.70	-.06
Speed	.70	.27	-.43
Environment	.56	.38	-.18
Friction	.72	.79	+.07
Goal Direction	.85	.72	-.13
Favoritism	.78	.75	-.03
Cliqueness	.65	.69	+.04
Satisfaction	.79	.69	-.10
Disorganization	.82	.81	-.01
Difficulty	.64	.44	-.20
Apathy	.82	.76	-.06
Democratic	.67	.57	-.10
Competitiveness	.78	.73	-.05
Average	.72	.62	

*1969 alpha reliability (Anderson, 1973)

internal consistencies in this study. They were Diversity, Speed and Environment.

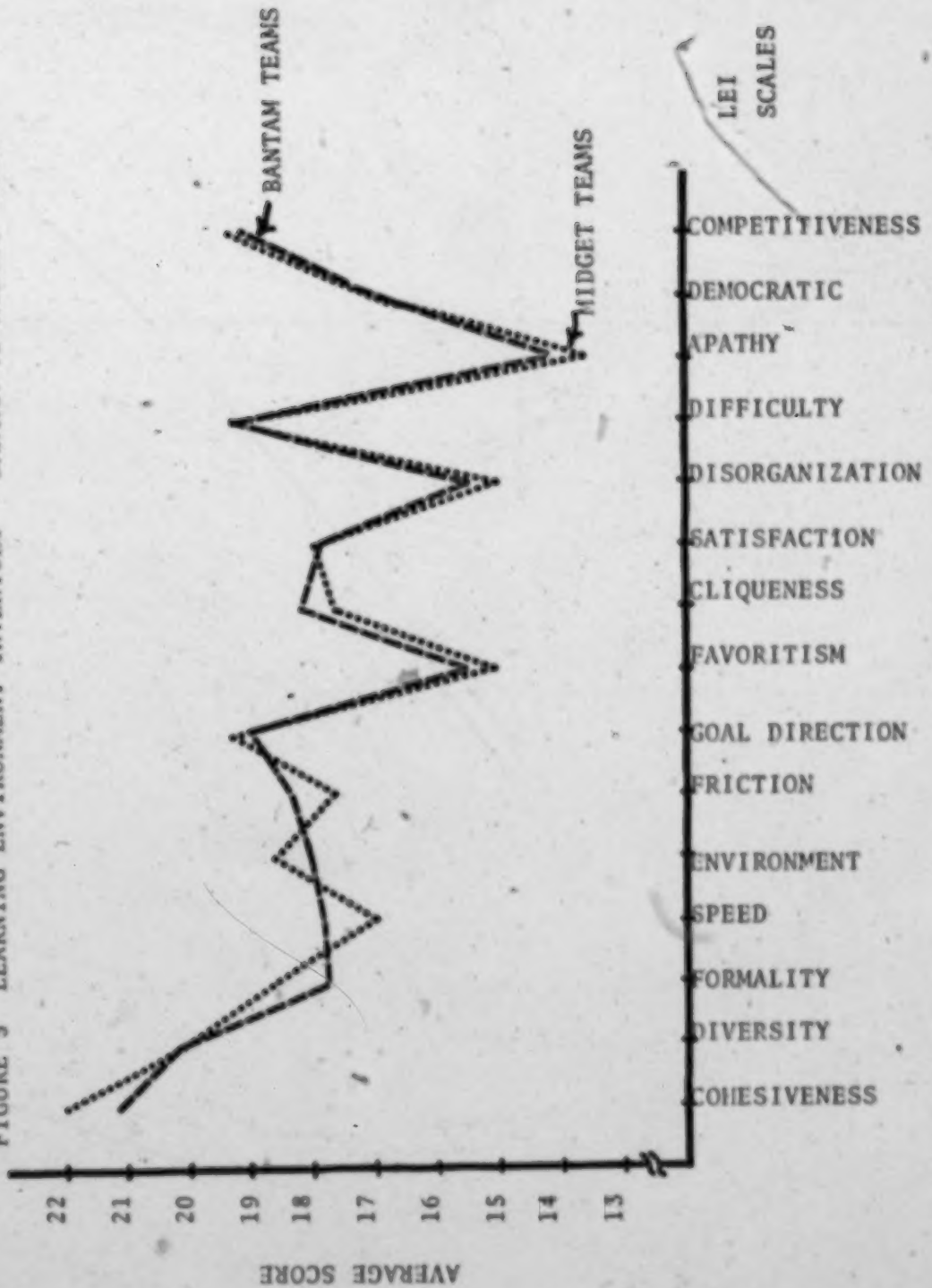


FIGURE 5 LEARNING ENVIRONMENT INVENTORY - BANTAM vs MIDGET TEAMS

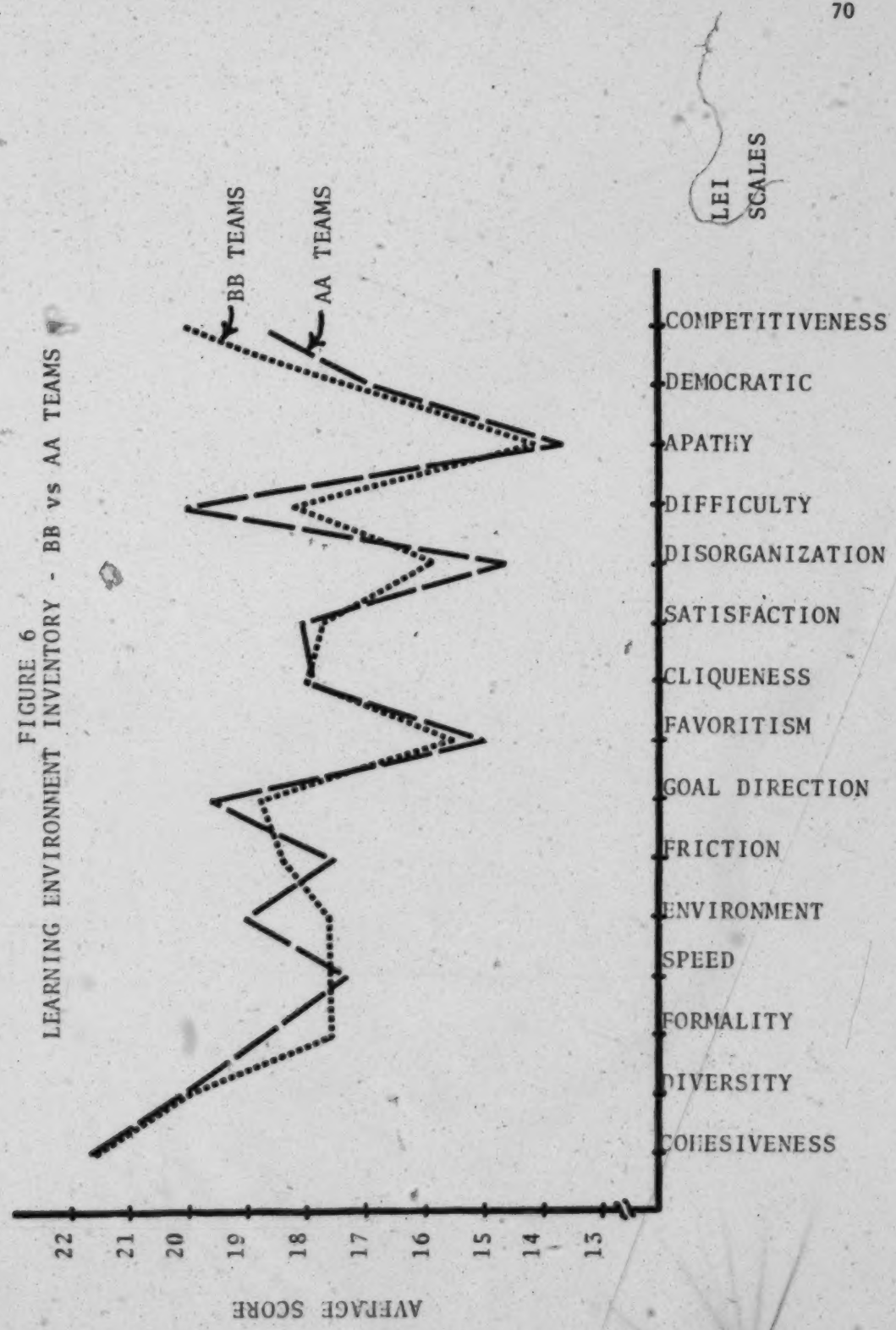


FIGURE 6
LEARNING ENVIRONMENT INVENTORY - BB vs AA TEAMS

Subsequent examination of items on each scale suggested that with some modification, internal consistency reliabilities (alpha) should be able to be improved considerably in future scales.

As with the CBDQ, 3 discriminant analyses were performed on league differences in terms of the LEI scales. The first analysis was performed on all the leagues and the 4 profiles were found to be essentially identical.

Again as was found with the CBDQ, no significant differences existed in perceived team environment between the profile of bantam teams vs that of midget teams. There was however, one significant difference found when the two leagues were compared separately on each scale (Figure 5). Table 20 shows that bantam teams were perceived to score significantly higher on the Speed scale than midget teams, however as mentioned previously, this scale had a low internal consistency. While Figure 5 suggests differences between the leagues in terms of perceived team cohesiveness, environment and friction, none of these were statistically significant on an individual basis.

A discriminant analysis showed that the profile of team environment as perceived by lower-skilled BB teams was significantly different from the profile as perceived by players in AA teams (Figure 6). In terms of contribution to the linear equation differentiating the two groups, the scales contributing most were Goal Direction, Difficulty and

TABLE 20

DISCRIMINANT ANALYSIS SUMMARY TABLE FOR BANTAM vs MIDGET TEAMS ON THE LEI

Scale Name	Scale Weight	One-Way F	Discriminant F
Cohesiveness	4.87	3.146	
Diversity	-0.18	0.116	
Formality	4.45	1.930	
Speed	-2.86	6.976*	
Environment	1.80	0.899	
Friction	-1.3	0.522	
Goal Direction	-3.24	0.158	
Favoritism	-2.60	0.491	
Cliqueness	-1.41	0.727	
Satisfaction	-3.01	0.010	
Disorganization	-0.00	0.133	
Difficulty	-1.64	0.051	
Apathy	2.52	0.262	
Democratic	-3.00	0.245	
Competitiveness	0.31	0.021	
Total			0.790

* denotes significance at .05 level

Competitiveness with the AA teams scoring higher on the first two and the BB teams scoring higher on the last. Higher skilled teams then, were perceived as having more goal direction, more difficult training, less intra-team competitiveness, less apathy, less democracy, less friction and less disorganization than were lower-skilled teams (Table 21).

Interpersonal Team Environment

Hypothesis 3 predicted no relationship between the way players perceived the behaviors of their coach, and the way they perceived the learning environment as defined by the coach and other members of the team. In order to test this

TABLE 21

DISCRIMINANT ANALYSIS SUMMARY TABLE FOR BB vs AA TEAMS ON THE LEI

Scale Name	Scale Weight	One-Way F	Discriminant F
Cohesiveness	-0.74	0.065	
Diversity	-1.59	0.116	
Formality	0.23	2.364	
Speed	1.05	0.313	
Environment	-1.93	7.864+	
Friction	2.50	0.883	
Goal Direction	4.43	1.659	
Favoritism	1.77	0.569	
Cliqueness	-1.78	0.020	
Satisfaction	1.74	0.240	
Disorganization	2.36	2.169	
Difficulty	-4.23	22.149+	
Apathy	-2.90	0.394	
Democratic	2.76	0.080	
Competitiveness	4.14	3.337	
Total			4.057+

+ denotes significance at .01 level

hypothesis, average team scores on each of the 5 CBDQ scales and 15 LEI scales were factor analyzed using principal components analysis and varimax rotation ((Hulaik, 1972). In total, 20 variables (scale scores) were analyzed over 40 subjects (teams). The factor structure matrix shown in Table 22.

The four-factor solution accounted for 74.7% of the total variance and as can be seen from the table, on 3 of the 4 factors moderate to high loadings were observed for both the CBDQ and LEI. The fourth factor was represented mainly by loadings from the LEI.

Factor 1 included only one major positive loading from

TABLE 22

FACTOR STRUCTURE MATRIX OF INTERPERSONAL TEAM ENVIRONMENT

Scale Name	Comm	Factor Names and Scale Loadings			
		Factor 1 Player-Dominated	Factor 2 Coach-Dominated	Factor 3 Goal-Dominated	Factor 4 System-Dominated
Teaching	.787	0.446	0.657	-.049	0.392
Consideration	.697	0.041		-.085	-.071
Initiation	.729	0.047	0.772	-.318	0.174
Pressure	.647	-.350	0.236	-.643	0.233
Representation	.784	0.130	0.861	-.075	0.139
Cohesiveness	.712	-.468	0.106	0.681	0.135
Diversity	.701	0.507	0.049	0.576	-.332
Formality	.846	-.008	-.574	0.537	0.478
Speed	.785	0.333	-.185	-.067	-.797
Environment	.721	-.257	-.403	0.682	0.162
Friction	.867	0.907	0.086	-.162	-.096
Goal Direction	.906	-.462	-.478	0.666	0.144
Favoritism	.567	0.680	0.303	-.075	-.086
Cliqueness	.790	0.865	0.155	-.047	-.127
Satisfaction	.800	-.705	-.144	0.531	-.000
Disorganization	.905	0.571	0.441	-.617	-.063
Difficulty	.613	-.029	-.570	0.499	0.195
Apathy	.789	0.591	0.235	-.616	-.067
Democratic	.692	-.772	-.223	-.012	0.216
Competitiveness	.542	0.731	0.054	-.066	0.010

the CBDQ, the Teaching scale. Strong positive loadings from the LEI included Friction, Cliqueness, Competitiveness, Favoritism, Diversity, Disorganization and Apathy. Negative loadings were seen on the Task, Democratic, Satisfaction, Cohesiveness, and Goal Direction scales. The interpretation of this factor was that it represented an interpersonal environment in which the players are dominant. The role of

the coach was perceived as being minor.

Factor 2, with positive loadings on Teaching, Consideration, Initiation, and Disorganization, suggested an environment in which the coach was perceived to be dominant. This pattern was also associated with negative loadings on Formality, Environment, Goal Direction and Difficulty. The coach in this type of environment, would be seen to provide all the structure and initiation; he would be perceived as requiring little of his players in terms of training, and the total environment would be seen as being informal, poorly set up in terms of facilities and equipment, and the team could be interpreted as suffering from a lack of goal direction.

The third factor was characterized by high positive loadings on perceived Cohesiveness, Diversity, Formality, Environment, Goal Direction, Satisfaction and Difficulty. Associated negative loadings were on Pressure, Disorganization and Apathy. This dimension, associated positively with such a number of large variables commonly thought of as goals in sport, was called Goal-Dominated. Responsibility toward the goals of team cohesiveness, satisfaction of both team and individual player's needs, adequate physical environment and well-defined goal direction appears to be undertaken by the coach and team together.

Factor 4 appeared to be related primarily to perceived

team environment and was called System-dominated. There are positive loadings from Formality and Teaching, and negative loadings from Diversity and Speed. In summary, this would appear to be an interpersonal team environment devoted to the maintenance of established systems in hockey.

In summary, with regard to the factor analysis performed hypothesis 3, there did appear to be relationships between social environment perceived to be associated with coaching behavior, and social environment due behaviors of team members. Four interpretable dimensions of interpersonal team environment found in this study were called Player-Dominated, Coach-Dominated, Goal-Dominated, and System-Dominated.

The question as to how these environments are related to coaching effectiveness is left to a subsequent section. It is appropriate at this point to determine the relationships between classification of coaches in terms of <u>personal</u> factors (i.e. Experience, playing experience, and motivation) and classification of coaches in terms of <u>perceived</u> factors (i.e. Player-dominated, coach dominated, goal-dominated and system-dominated).

<u>Coaching Classification and Interpersonal Team Environment</u>

It will be obvious at this point that one of the basic assumptions in the study was that the coach is an important aspect of the total environment of an athletic team. To this

point, it has been shown that three unrelated personal dimensions along which hockey coaches can be classified are in terms of a) their experience - a composite of age and coaching experience, b) their playing experience and c) their motivation as defined by Fiedler's (1967) LPC score. Hockey teams, on the other hand, were seen to be classifiable in terms of whether they perceived their team to be player-dominated, coach-dominated, goal-dominated or system-dominated.

It is outside the domain of the present study to stipulate which of the two systems of classification are more valid in the general situation. Presumably if one were interested in the question from the athletes' point of view, the latter system would be more applicable, the opposite being the case if one were interested in classifying coaches irrespective of their teams. It is however, within the domain of this study to investigate the relationships between the two systems of classification. This problem will now be considered.

Factor scores for each coach on the three personal dimensions were computed as were factor scores for each coach's team on the interpersonal team environment dimensions. The seven factor scores were subjected to a principal components analysis, and the resulting matrix rotated to a varimax criterion for simple structure. Table 23 shows the factor structure matrix.

The four factors represented 56.06% of the total

TABLE 23

FACTOR STRUCTURE MATRIX OF DIMENSIONS OF COACHING CLASSIFICATION AND INTERPERSONAL TEAM ENVIRONMENT

Variable	Commun-ality	Factor 1	Factor 2	Factor 3
Player-Dominated Environment	.182	-.409	-.112	-.050
Coach-Dominated Environment	.641	0.611	-.240	0.457
Goal-Dominated Environment	.612	0.036	0.772	0.123
System-Dominated Environment	.526	0.399	-.068	0.128
Experience	.678	-.808	0.097	0.128
Playing Experience	.625	0.217	0.072	0.757
Motivation	.660	-.045	0.810	-.044
Total	3.924	1.394	1.343	1.188

variance of scores in the total matrix, and as such, some caution is warranted in generalization. However, from Table 23 it can be seen that factor 1, which remains unnamed, is represented by an environment which is perceived as coach- and system-dominated and a coach who has little experience. In addition, there is very little player domination. Factor 2 represented a combination of a goal-dominated environment, and a relationship-oriented coach. This finding in itself is logical in the sense that goal-dominated environments are defined by perceived team cohesiveness, goal direction, organization, satisfaction, favorable training environment and non-pressuring coaching.

The last factor was again defined by a coach-dominated

environment -- but in combination with more playing experience, and less system-domination. Primary differentiation between this factor and the first coach-dominated factor, appeared to be that in this factor the coach had average coaching experience but more playing experience while the former has less coaching experience and average playing experience.

In summary then, hypothesis 4 must be rejected in the sense that incomplete principal components analysis provided a means of accounting for slightly over half of the total variance between coaching classification based on personal data and classification based on team-perceived data. In practical terms there appeared to be relationships between coaches and the way their teams perceive them. One such relationship is that coaches with little experience tended to be perceived by their teams as more dominating than did coaches with more experience. Similarly, coaches with motivation which was interpersonally-oriented, tended to be associated with goal-oriented, satisfied teams. Lastly, coaches with more than average playing experience tended to be perceived as dominating in their teams.

Hypothesis 5 refers to whether or not coaches perceive the same interpersonal environment as do athletes. Specifically, if the 40 coaches were to be divided into two groups, one with good coach-athlete relations as perceived by the coach, the other with poor relations; could these two

groups be differentiated in terms of the four dimensions of interpersonal environment as perceived by the athletes?

In order to test this hypothesis, the two groups were formed by dividing the teams at the medium score of the TA scale. A one-way analysis of variance was computed on the factor scores for each team on the four variables. The summary is given in Table 24.

As can be seen from the table no one dimension of

TABLE 24

ANALYSIS OF VARIANCE SUMMARY TABLE FOR COACH vs ATHLETES' PERCEPTIONS OF THE COACH-ATHLETE RELATIONS

Variable	SS	df	MS	F
Player-Dominated	3.29	1	3.29	3.51
Error	35.7	38	0.96	
Coach-Dominated	2.57	1	2.57	2.68
Error	36.4	38	0.96	
Goal-Dominated	0.12	1	0.12	0.737
Error	38.87	38	1.02	
System-Dominated	0.87	1	0.87	0.87
Error	38.12	38	1.00	

* denotes significance at .05 level

perceived team interpersonal environment had values which allowed it to discriminate between teams with poor vs good coach-athlete relationships. The obvious conclusion must therefore be made that coaches and athletes perceive different environments.

Dalhousie Coach Observation Schedule

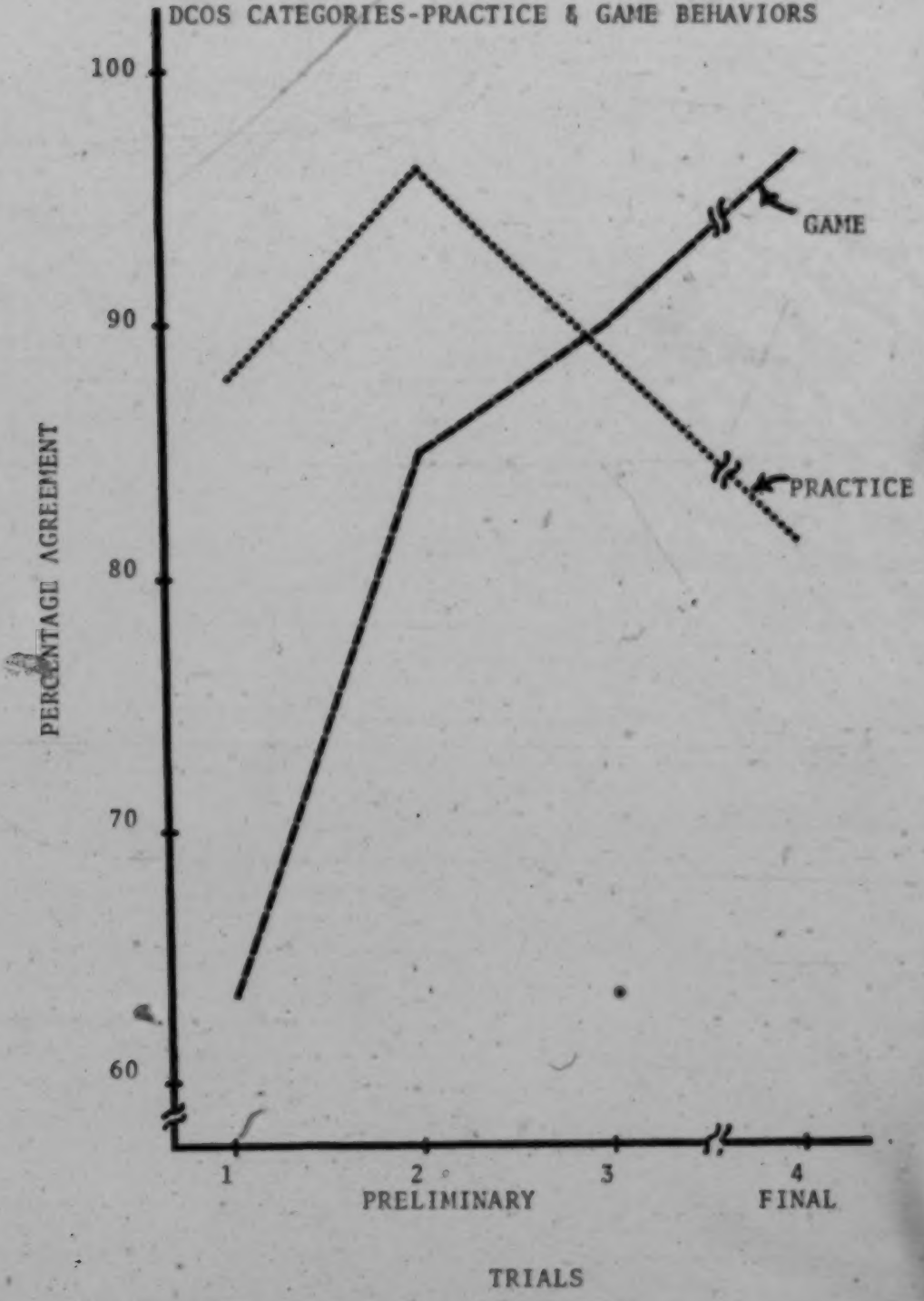
To this point all analyses have been based on data provided from either the team (CBDQ, LEI) or the coach (age, SES, coaching experience, playing experience, and motivation). One of the objects of the study was to compare results obtained from the above two data sources, with data obtained from a sport-specific observational instrument. The DCOS scale provided these data. Scale listings and descriptions of DCOS categories are given in Appendix 6.

Figure 7 shows observer reliability and objectivity in game and practice situations using the method proposed by Rushall (1973). It can be noted in this figure that other than the first test session, all inter-observer reliabilities were greater than 80 per cent. This figure is within the bounds as suggested by Rushall (1973: 3). With regard to reliability checks, the final session resulted in inter-observer reliabilities of 81.2 per cent for practice behavior and 96.7 per cent for game behavior.

Hypothesis 6 states that there are no relationships among dimensions of observed coaching behavior in game or practice situations. In order to test this, Pearson product moment correlation coefficients were calculated among all seven scales for both practice and game behavior. Table 25 shows the lower triangular matrix of correlations for practice behavior computed on 11 coaches.

FIGURE 7

PAIRED-OBSERVER PERCENTAGE AGREEMENT ON DCOS CATEGORIES-PRACTICE & GAME BEHAVIORS



As can be seen in the table, Questioning (Q) behavior

TABLE 25

CORRELATIONS OF DCOS SCALES - PRACTICE BEHAVIOR (N=11)

Scale	F-R	C-P	Q	D-E-I	M-A	M	N A
F-R	1.00						
C-P	-.06	1.00					
Q	-.35	-.14	1.00				
D-E-I.	0.12	-.19	-.58*	1.00			
M-A.	-.42	-.07	-.18	-.18	1.00		
M	-.01	-.09	0.72+	-.68+	-.49	1.00	
N A	-.11	0.06	0.63*	-.59*	-.23	0.61*	1.00

* denotes significance at .05 level
+ denotes significance at .01 level

is positively related to Managing (M) and No Activity (NA) behaviors, and negatively related to Directing-Explaining-Informing (D-E-I) behaviors. M behavior is negatively related to D-E-I behaviors while NA is positively related to Q and M, and negatively related to D-E-I. Because of the small number of subjects relative to the scales, it is inappropriate to subject the matrix to factor analysis, however, certain relationships can nonetheless be seen. Managing, no activity and questioning behavior patterns tend to occur together with D-E-I behaviors being noticeably absent.

Table 26 shows the same matrix of inter-correlations, computed on 18 subjects in game situations. Here it can be observed that while feedback-reward (F-R) tends to be accompanied by correcting-prohibiting (C-P) behaviors, it is <u>not</u> accompanied by either monitoring-attending (M-A) or M behaviors. Simply observing games (ie. M-A behaviors), and

being unassociated with either positive or negative behavior, are also inversely related with D-E-I behaviors. The interpretation of this is reasonable on the grounds that while a number of coaches were observed giving frequent response to action on the ice, others spent the majority of the game simply observing the play.

Thus with regard to hypothesis 5 it must be concluded

TABLE 26

CORRELATIONS OF DCOS SCORES - GAME BEHAVIOR (N=18)

Scale Name	F-R	C-P	Q	D-E-I	M-A	M	NA
F-R	1.00						
C-P	0.57+	1.00					
Q	0.12	-.23	1.00				
D-E-I	0.15	0.06	0.23	1.00			
M-A	-.69+	-.65+	-.07	-.60+	1.00		
M	-.41*	-.13	-.33	0.18	-.08	1.00	
A	-.19	-.25	-.08	-.39	0.12	0.30	1.00

* denotes significance at .05 level
\+ denotes significance at .01 level

that in practice situations, D-E-I behaviors of coaches tend to cluster apart from a constellation of Q, M and NA behaviors. This suggests two quite opposing coaching patterns - one involving a great deal of personal control over the players - the other involving very little structuring of the environment. In game situations, the personal contact dimension was seen again in a tendency either to provide <u>both</u> F-R and C-P or to be concerned with M-A with little emphasis on D-E-I behaviors.

Figure 8 shows average frequencies of behavior shown by the coaches observed with the DCOS in game and practice situations. Seven coaches not observed during practice, are included in the curve depicting game behavior frequency. The relationships among the seven DCOS categories in both situations provide a comparison of the proportion of time spent by coaches on various observable behaviors.

It is readily apparent that the majority of time for hockey coaches in both game and practice situations, is spent on observation of play on the ice. There are, however, differences between categories when compared across the two situations. Correlations of behavior ratings on 11 coaches across game and practice situations are given in Table 27.

There was therefore, within the limitations of the

TABLE 27

CORRELATION BETWEEN PRACTICE AND GAME BEHAVIOR AS MEASURED BY THE DCOS

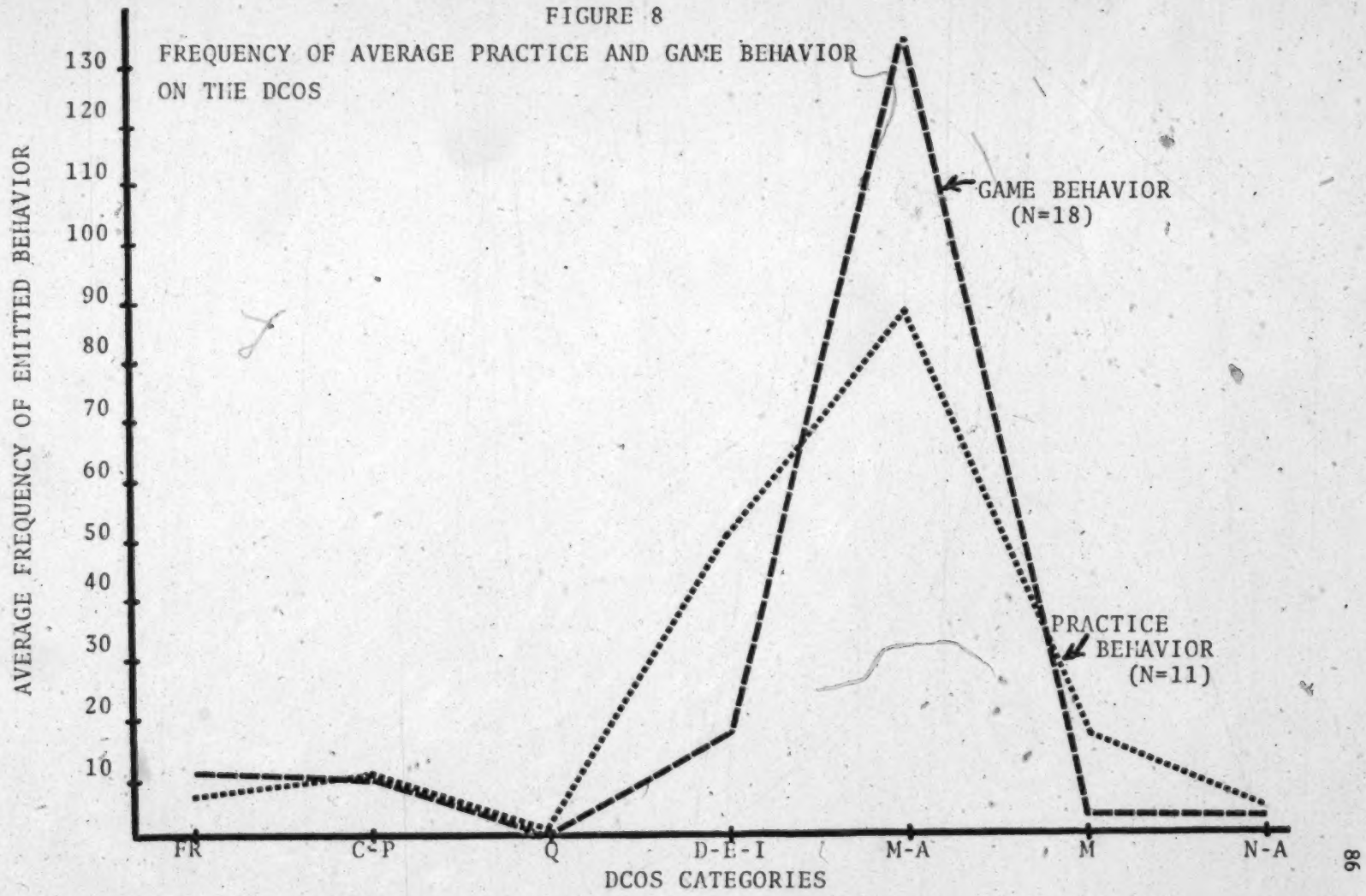
Behavior Category	Corr. Between Game and Practice
Feedback-Reward	0.50
Correcting-Prohibiting	0.21
Questioning	0.04
Directing-Explaining-Informing	0.02
Monitoring-Attending	0.24
Managing	0.49
No Activity	-.16

* denotes significance at .05 level

number of subjects used, no correlation between observed coaching behavior in game and practice situations. Hypothesis 7 was not rejected.

FIGURE 8

FREQUENCY OF AVERAGE PRACTICE AND GAME BEHAVIOR ON THE DCOS



Coaching Effectiveness

The remainder of the analyses were concerned with the evaluative aspect of the study. For all further analyses concerned with effectiveness, the percentage of total possible points gained by each team was used as the criterion.

This measure was obtained by calculating the total number of league-play points obtained by each team, and dividing the figure by the total number of points which could have been obtained had the team won all its games. In order to test the possibility that for some unknown reason (e.g. Sampling) a given league could have had a significantly different percentage total possible points than other leagues, a two-factor analysis of variance similar to those conducted on coaches' personal data, was conducted on percentage of total points. Table 28 shows the summary for this analysis.

Different leagues therefore, were not represented disproportionately in terms of how successful they were, when league win-loss record was used as a criterion. The question was then addressed as to what this win-loss record means to players.

Hypothesis 8 stated that there is no relationship between interpersonal team environment as perceived by athletes and win-loss ratio as measured above. In order to

TABLE 28

ANALYSIS OF VARIANCE SUMMARY TABLE FOR PERCENTAGE OF POINTS WON

Source of Variation	SS	df	MS	F
Skill (BB-AA)	173.93	1	173.93	0.31
Age (B-M)	550.04	1	550.04	0.97
Skill x Age	2.139	1	2.139	0.00
Error	20419.0	36	567.19	
Total	31145.109	39		

*denotes significance at .05 level

test this hypothesis, all 40 teams were divided at the median into two groups, 20 teams which had an unsuccessful season in terms of league win-loss percentage, and 20 teams which had a successful season. These two groups were labeled losing teams and winning teams respectively.

A one-way analysis of variance was performed on the two groups using factor scores of each of the teams on the four factors of Player-Dominated, Coach-Dominated, Goal-Dominated and System-Dominated environments. Table 29 shows this summary along with the average percentage of total possible points.

The interesting finding appeared here that losing teams scored above average on the Coach-dominated dimension and below average on the Goal-dominated dimension. The opposite was true for winning teams. In summary of hypothesis 8, therefore it must be concluded that successful team

TABLE 29

ONE-WAY ANALYSIS OF VARIANCE ON PERCENTAGE TOTAL POSSIBLE POINTS AGAINST INTERPERSONAL TEAM ENVIRONMENT

Interpersonal Environment	Losing Team Average %	Winning Team Average %	F
Player Dominated	0.26	-.26	2.87
Coach Dominated	0.37	-.37	6.19*
Goal Dominated	-.49	0.49	12.15+
System Dominated	0.11	-.11	0.55

*denotes significance at .05 level
+denotes significance at .01 level

performance in terms of win-loss record was negatively related to Coach-domination and positively to Goal-domination. Additionally it should be stressed that effective coaching measured in terms of win-loss record was also found to be effective coaching in terms of a factor with high loadings on team goal-direction, cohesiveness and satisfaction. It would therefore be valid to define win-loss record as a measure of coaching effectiveness. At this point it may be useful to restate that the Coach-dominated dimension is an environment associated with a coach who is perceived to score highly on the CBDQ scales of Teaching, Consideration, Initiation and Representation. The Goal-dominated dimension, on the other hand is represented mainly on the CBDQ scales by a perceived non-pressuring style of coaching. The results of this analysis show that a non-pressuring style of coaching as perceived by the players,

was positively related with most of the commonly accepted criteria of successful coaching. Hypothesis 9 would therefore be rejected.

According to Fiedler's model (1967) there is a curvilinear relationship between LPC score and group performance, when the situation varies from being highly favorable for leadership (high TA scores, high Goal Direction scores) to highly unfavorable (low TA, low Goal Direction). The relationship is postulated to be in the form of an inverted U indicating that task-motivated leaders are more effective in both favorable and unfavorable situations while relationship-motivated leaders are more effective in situations of medium favorableness (see Figure 1).

In the present study two variables were used to define the situation - TA score for an indicant of the coach-athlete relations, and LEI goal direction score (GD) for an indicant of the structuredness of the task. In order to apply (not test) Fiedler's model in a coaching situation, four equally numbered groups were formed on the basis of a) TA score obtained from the coach, and b) goal direction score obtained from the athletes. Within each of the four groups, Spearman rank-order correlations were computed between the coaches' LPC scores and the win-loss record of their teams. The same correlations were obtained between coaches' coaching experience and win-loss record, and coaches' playing experience and win-loss record.

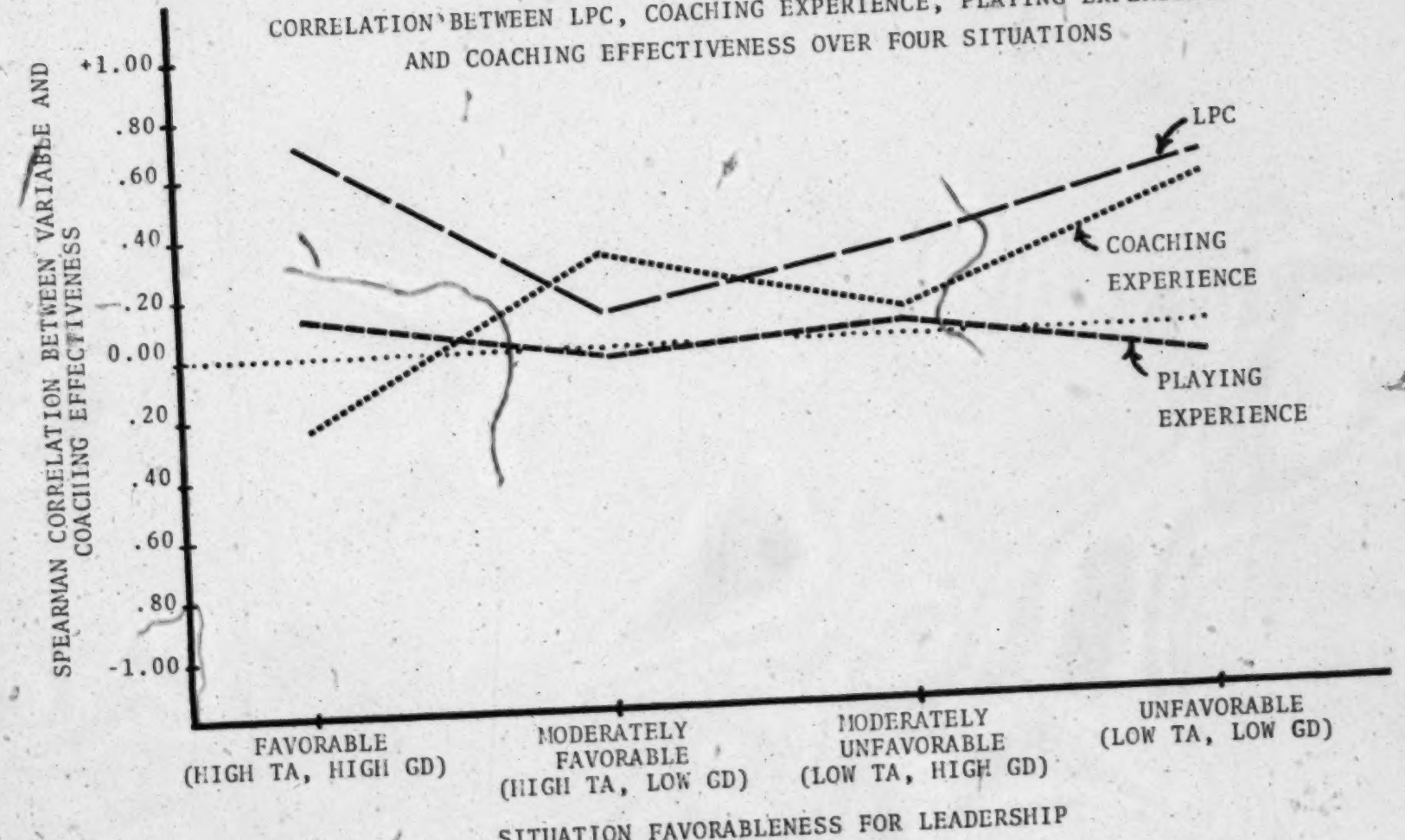
It will be recalled that the three independent dimensions of coaching classification resulting from analysis 1, were Experience, Playing Experience and Motivation. In the present analysis, rather than using factor scores for each coach, raw scores on the above mentioned three variables were correlated against the win-loss record of the team. Figure 9 shows the correlations between the three variables and the criterion, over four octants of situation favorableness for leadership.

Only two of the 12 correlations on Figure 9 were significant, and neither accounted for more than 50% of the common variance. It is noteworthy, as well, that they are both positive between the LPC variable and win-loss. The interpretation would be that in favorable and unfavorable situations, the more relationship-oriented the coach, the greater is his effectiveness. This finding is in complete contradiction to Fiedler's task model which postulates a negative correlation in both of these situations. Thus it must be concluded that hypothesis 9 must be rejected.

It will be recalled that one of the basic assumptions made in the present study, was that groups in sport (i.e. Hockey) could be classed as task groups in which the group goal is accomplishment of a designated task. In his 1971 revision of the Contingency model Fiedler noted that there may not be a curvilinear relationship between LPC and group performance in groups oriented toward training objectives.

FIGURE 9

CORRELATION BETWEEN LPC, COACHING EXPERIENCE, PLAYING EXPERIENCE AND COACHING EFFECTIVENESS OVER FOUR SITUATIONS



Summarizing this situation, Fiedler noted that "there might well be a psychological difference in leading a group for the purpose of benefiting the members and leading a group for the purpose of benefiting the organization (Fiedler, 1971b: 145-146)."

Thus it would appear that either the initial assumption made here, that sport groups could be classified at least in part as task groups, could well have been in error. It could also have been possible that the situation was poorly defined. The former possibility seems the more likely and leads to the conclusion that the more relationship-oriented the coach tends to be, the greater is the likelihood of his coaching being effective.

This was born out in a correlation of .39* between LPC score and coaching effectiveness over the entire 40 coaches and is exceeded only by the correlation, again significant, between TA score and coaching effectiveness (.52+). While these correlations are lower they do give an idea of the direction of the relationship.. The latter correlation however, as Mitchell et al (1970) and Graen et al (1971) have suggested, could well be inflated due to its post hoc administration.

The conclusion over the entire issue of applying the Contingency Model must be made that it would not appear to be applicable in situations involving hockey coaching. This, if in fact true, is a highly significant finding which

should aid considerably in setting future directions for research in coaching.

Closely related to hypothesis 9, the last hypothesis was concerned with the prediction of coaching effectiveness using DCOS scores. Again, due to the small number of coaches involved, correlations were performed rather than discriminant analysis or analysis of variance between teams with good win-loss records and those with poor win-loss records. Table 30 shows the correlations between game and practice DCOS categories and coaching effectiveness.

The only significant relationship was seen between

TABLE 30

CORRELATIONS BETWEEN DCOS AND COACHING EFFECTIVENESS

Practice Behavior (N=11)	Correlation with Effectiveness
F-R	-.59*
C-P	-.02
Q	0.50
D-E-I	-.08
M-A	0.09
M	0.13
NA	0.35
Game Behavior (N=18)	
F-R	-.06
C-P	-.27
Q	-.10
D-E-I	-.15
M-A	0.00
M	0.32
NA	0.25

* denotes significance at .05 level

Practice F-R and win-loss ratio suggesting that increased feedback-reward is associated with decreased win-loss ratio. Apart from this correlation, none of the other DCOS

categories correlated significantly with coaching effectiveness as indicated by win-loss points.

It seems highly likely that the DCOS categories were not given an adequate test in this hypothesis. The finding that the only significant correlation between a behavioral category and coaching effectiveness was in the feedback-reward area and was in fact negative, is a difficult finding for reinforcement theory to handle. It would therefore be quite outside the bounds of statistical rigor to generalize the present findings. They are, however, extremely interesting and suggest a number of alternatives for further research. It should also be noted that one of the stated limitations of the study was that only one observation for both game and practice behavior was colelcted.

CHAPTER 5

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study was twofold: to describe leadership in coaching and to evaluate it. To this end, 506 athletes and 40 coaches constituting a representative sample of hockey teams in the city of Edmonton, were investigated using a number of research techniques and methodologies.

One section of the study was based on descriptions of the teams involved in terms of age (bantam vs midget teams), SES and level of ability (BB teams vs AA teams). Appropriate statistical techniques were used to check that no one league or combination of leagues was disproportionately represented in terms of these variables. Similar analyses were performed on the ages, SES, playing experience, coaching experience and coaching motivation of the 40 coaches.

Coaching leadership was described in terms of

a) personal characteristics of the coach,

b) behavioral characteristics of the coach as perceived by athletes, and

c) observed behavioral characteristics of the coach using a sport-specific observational instrument.

After investigating the properties of each type of measurement separately, comparisons among the 3 approaches were made. This procedure was undertaken in the objective of arriving at a composite view of leadership as it exists in hockey coaching at the present time.

With regard to the evaluation of coaching leadership a number of criteria were used. The objective criterion of team performance (i.e. Win-loss ratio) was compared with interpersonal criteria as perceived by athletes.

So as to evaluate the effectiveness of hockey coaches, the objective criterion was compared with coaches' scores obtained from each of the 3 methodologies mentioned above. Relative merits of each methodology were discussed and a composite view of coaching effectiveness was suggested.

Problems involved in the use of each method were explored with particular reference to their use in sport. Due to the complexity of the study, an attempt will be made here to summarize in point form the major findings.

In the description of coaching leadership the following results were found:

1. There appeared to be three unrelated dimensions of classification of hockey coaches on the basis of personal data; namely in terms of experience, playing experience and motivation as measured by the LPC score. These measures, with exception of LPC, were related to the level of ability

of the teams coached, with coaches of more experience and playing experience being involved in the higher-skilled leagues. LPC was found to be unrelated to personal variables, age of players coached or level of ability of the team coached.

2. Use of the two questionnaires of perceived coaching behavior (CBDQ) and perceived learning environment (LEI), provided measures with acceptable internal consistency. Individually, both instruments were effective in differentiating between BB teams and AA teams. Lower-skilled teams tended to perceive their coaches as being more critical and pressuring than did the more highly skilled teams. Discriminant analysis showed that the profile of AA teams was significantly different from that of BB teams with the former being perceived as more difficult, less disorganized, more satisfied, more goal-directed and having a better physical environment in which to play. When the two inventories were used together to categorize teams, four team interpersonal environments were found, named on the basis of highly loading subscales. They were Player-dominated, Coach-dominated, Goal-dominated and System-dominated.

3. The DCOS analysis, performed on only 11 (practice behavior) and 18 (game behavior) of the 40 coaches involved in the study, showed two major classes of observed behavior in each case. One was a class of behaviors involving interaction and interpersonal contact with the athletes, and

the other was a class of behaviors unrelated to this interpersonal contact. These classes, however, were defined only by means of inspection of inter-category correlation matrices. Regarding the frequency of behaviors across categories, hockey coaches in both game and practice situations appeared to spend a great deal of time in monitoring-attending behaviors. Behavior in categories observed in practice situations were not significantly related to behavior in the same categories in game situations.

4. In comparing the three forms of description, coaches with less than average experience were seen to be related to environments perceived to be Coach-dominated, as were coaches with greater than average playing experience. Coaches with more that average experience were associated with environments perceived to be Player-dominated. Coaches with greater than average interpersonal-motivation as indicated by LPC score, were seen to be associated with Goal-dominated environments.

In the evaluation of coaching leadership, the following results were obtained:

1. Win-loss ratio, an objective measure of coaching effectiveness, was significantly related to perceived Goal-dominated and Coach-dominated interpersonal environments. The relationship was positive in the former and negative in the latter. Win-loss ratio was therefore used as an overall measure of coaching effectiveness.

2. Using win-loss ratio as the measure of coaching effectiveness, coaches with high LPC scores or high TA scores were found to be significantly more successful than coaches with low scores on these variables. Coaching experience, age and playing experience were found to be unrelated to overall coaching effectiveness.

3. Coaching dimensions perceived to be related to Goal-dominated interpersonal environments were more effective than coaching dimensions related to Coach-dominated environments.

4. When the leadership situation was partitioned into four situations of increasing favorableness for the coach, the opposite correlation between LPC and team performance was seen in hockey using Fiedler's Contingency model. This was interpreted as indicating that a) hockey teams are not examples of task groups as defined in Fiedler's Contingency model (1967, 1971b), or b) the situation was not partitioned correctly. The former possibility seemed to be the more logical explanation and suggests a new avenue for further research.

5. Observed coaching behavior, either in game or in practice situations, was not significantly related to coaching effectiveness. This finding, however, was qualified due to the small number of coaches observed and to the fact that the DCOS was primarily designed for behavior change rather than classification. Further work with this instrument using procedures outlined by Rushall (1973:8) is in order.

Conclusions

Leadership theory and research methodologies are useful in research on coaching. However there appear to be moderating variables involved which preclude carte blanche adoptions of theories presently available in psychology.

The results in this study supported the view that perceived behavior is a fruitful avenue for research on coaching. Within the limitations of the study, the same conclusion could not be drawn in the case of objective behavior measurement. However, as has been stated previously, the study was designed primarily for the investigation of perceived behavior and undoubtedly put the behavioral methodology at a disadvantage.

Generally speaking, absence of pressure, interpersonal concern and positive attitudes toward athletes appear to be much more effective in hockey coaching than do dominating, impersonal, prescriptive approaches. However, this statement should not be construed as supporting the currently popular conception in sport that a 'democratic' approach is the "best" and "only" way to coach. The relationship between the coach and athlete, at least in the hockey situation, is definitely influential in nature. That is to say, the coach exerts some form of control which this study has been not able to fully measure. Also, the study was dealing with entire teams and completely ignores the relationship between

the coach and the individual athlete. Perhaps it is in this area that further work is indicated.

Recommendations

As a result of the work presented above, the following proposals are in order:

1. More work should be done on the relationship between individual athletes and their coaches.
2. The model of leadership effectiveness as used in this study should be modified to account for training groups as opposed to task groups.
3. Attention should be focussed on the LPC variable as it related to other personal attributes of the coach, the situation and the influence relationship between the coach and athletes.
4. Replication of studies similar to the above, should be conducted on coaches in other octants of the model proposed in Figure 1.
5. Further work must be done between the relationship between perceived coaching behavior and observed coaching behavior particularly with relevance to the improvement of hockey coaching.
6. In comparing perceived behavior with observed behavior, attention should be focussed on longitudinal studies.
7. In examining perceived behavior, more work should be directed at how perceptions of athletes change over the season.

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APPENDIX 1

TEAM REPRESENTATION

TEAM NAME	TOTAL NO PLAYERS	NO. TESTED	% TESTED	NO. LEI	NO. CBDQ
Bantam - BB					
1	15	12	80.0	6	6
2	18	11	61.1	8	3
3	12	10	83.3	5	5
4	12	8	66.6	3	5
5	15	13	86.7	7	6
6	17	13	76.5	8	5
7	9	6	66.7	4	2
8	15	14	93.3	7	7
9	17	12	70.6	6	6
10	15	15	100.0	7	8
Mean	14.5	11.4	78.73	6.1	5.3
BANTAM - AA					
11	16	14	87.5	8	6
12	16	14	87.5	8	6
13	16	14	87.5	8	6
14	16	14	87.5	7	7
15	16	15	93.8	7	8
16	15	13	86.7	6	7
17	14	7	50.0	3	4
18	16	16	100.0	8	8
19	15	13	86.7	5	8
20	16	13	81.3	4	6
Mean	15.60	13.3	84 85	6.7	6.6
MIDGET - BB					
21	15	12	80.0	4	8
22	15	15	100.0	7	8
23	14	10	71.4	5	5
24	17	16	94.11	8	8
25	16	11	68.8	5	6
26	17	15	88.2	9	6
27	17	12	70.6	5	7
28	15	13	86.67	6	7
29	18	11	61.1	6	5
30	17	11	64.7	3	8
Mean	16.1	126	78.56	5.8	6.8
MIDGET - AA					
31.	16	16	100.0	8	8
32	16	15	93.8	8	7
33	15	12	80.0	6	6
34	16	15	93.8	7	8
35	16	9	56.3	5	4
36	15	14	93.3	8	6
37	16	15	93.8	8	7
38	16	14	87.5	7	7
39	15	12	80.0	5	7
40	16	10	62.5	5	5
Mean	15.7	13.2	84.1	6.7	6.5

APPENDIX 2

AVERAGE TEAM AGE, SOCIO-ECONOMIC STATUS AND PLAYING EXPERIENCE

LEAGUE EXPERIENCE	TEAM	AGE	SES	PLAYING
BANTAM - BB	1	13.67	33.52	5.25
	2	13.80	34.12	2.90
	3	13.44	49.01	4.67
	4	13.50	39.59	5.25
	5	13.75	54.43	5.50
	6	13.83	40.16	3.33
	7	13.40	42.70	3.80
	8	13.92	41.25	6.54
	9	14.30	57.99	6.10
	10	14.29	44.53	3.50
	Mean	13.79	43.73	4.68
BANTAM - AA	11	14.00	45.55	6.54
	12	13.92	45.40	6.62
	13	14.00	47.41	6.00
	14	13.77	52.69	6.08
	15	13.93	40.31	7.71
	16	14.26	55.95	7.83
	17	13.50	41.58	5.83
	18	13.80	47.98	6.93
	19	14.25	48.27	6.92
	20	14.00	47.76	7.17
	Mean	13.94	47.29	6.76
MIDGET - BB	21	15.82	41.28	8.36
	22	15.93	36.67	4.64
	23	15.22	34.90	6.00
	24	15.47	53.70	5.53
	25	15.90	52.23	7.80
	26	15.36	39.92	6.79
	27	15.82	56.51	7.73
	28	15.50	50.62	3.58
	29	15.90	40.36	7.00
	30	15.40	43.78	5.10
	Mean	15.63	44.99	6.25
MIDGET - AA	31	16.13	43.19	9.07
	32	15.86	50.90	7.29
	33	16.27	47.22	8.55
	34	15.64	44.28	7.07
	35	15.87	45.52	8.12
	36	16.15	53.03	8.15
	37	15.93	46.52	7.21
	38	15.85	39.53	7.62
	39	15.36	44.65	7.18
	40	16.11	51.79	7.78
	Mean	15.92	46.66	7.80
GRAND MEAN		14.82	45.67	6.38

APPENDIX 3

COACHES' DATA

TEAM	AGE	SES	PLAYING EXPERIENCE	COACHING EXPERIENCE	LPC	TA
BANTAM - BB						
1	30	37.40	15	2	59	39
2	39	33.80	0	1	45	32
3	19	39.55	9	2	73	58
4	42	41.60	0	2	82	76
5	40	75.42	0	3	73	53
6	39	28.22	0	6	78	75
7	32	42.98	0	1	60	72
8	32	31.30	0	5	88	60
9	43	62.04	10	4	79	64
10	22	54.75	6	1	60	60
Mean	33.80	44.68	4.00	2.70	69.70	58.90
BANTAM - AA						
11	21	70.14	10	3	62	70
12	48	55.22	9	4	85	63
13	40	34.38	25	8	69	65
14	36	55.19	24	8	63	65
15	28	37.00	10	2	79	52
16	31	33.49	6	12	65	65
17	29	45.05	18	7	74	64
18	33	33.49	5	7	78	68
19	46	44.82	10	5	62	71
20	43	45.05	2	10	60	56
Mean	35.50	45.38	11.90	6.60	69.70	63.90
MIDGET - BB						
21	32	26.71	3	5	80	75
22	36	52.07	0	20	46	46
23	27	37.14	6	1	54	55
24	25	53.29	15	1	54	47
25	27	29.26	10	6	75	74
26	31	54.54	10	3	60	58
27	27	70.14	10	3	60	67
28	31	59.20	5	6	97	58
29	27	37.14	16	2	78	80
30	37	37.14	15	8	62	50
Mean	30.00	45.66	9.00	5.50	66.60	61.00
MIDGET - AA						
31	36	67.50	3	8	76	80
32	36	46.75	10	10	96	46
33	44	30.52	10	5	80	79
34	27	40.68	2	1	83	49
35	29	42.98	12	8	99	65
36	37	52.07	16	10	94	80
37	42	35.05	10	9	26	65
38	33	45.05	6	8	42	75
39	26	70.14	8	2	69	48
40	31	67.50	12	3	71	69
Mean	34.10	49.82	8.90	6.40	73.60	65.60

APPENDIX 4

COACH BEHAVIOR DESCRIPTION QUESTIONNAIRE SUBSCALES

TEACHING - refers to a behavioral style centered around the concept of providing players with an educational experience in sport. Also refers to democratic approach to problems and interpersonal interaction.
Items:
He uses constructive criticism.
He makes team members feel at ease when talking with him.
He lsts team members know how they are doing.
He gets team approval on important matters before going ahead.
He explains his reasons for criticisms.
He is willing to make changes.
He criticizes a specific act rather than a person.
He shows team members how each responsibility fits into the total picture.
He treats all team members as his equals.

CONSIDERATION - refers to a behavioral style centered around the consideration of players working under the coach.
ITems:
He speaks in public in the name of the team.
He encourages the team to organize social activities.
He provides for team members to communicate with each other.
He contacts important people in an effort to help the team.
He helps members of the team settle their conflicts.
HE ATTENDS SOCIAL EVENTS OF THE TEAM
He has team members share in making decisions.
He calls the team together to talk things over.
He sees to it that team members have the equipment they need.

INITIATION - refers to a behavioral style centered around the organization and initiation of team activities.
Items:
He coaches without a plan. (reverse)
He figures ahead on what should be done.
He plans his practices in detail.
He stresses consistent methods of training.
He schedules the work to be done.
He suggests new approaches to problems.) He decides in detail what should be done and how it should be done.
He emphasizes the quality of training.
He is first in getting things started.

PRESSURE - refers to a behavioral style centered around criticism as a motivational device.
Items:
He criticizes a team member in front of others.
He criticizes poor performance.
He "needles" team members toward greater effort.
He lets the team set its own goals. (reverse)

He criticizes team members for small mistakes.
He asks for sacrifices from individuals for the good of the team.
He lets team members work at their own speed. (reverse)
He maintains definite standards of performance.
He invites criticism of his acts. (reverse)

REPRESENTATION - refers to a behavioral style centered around the representation of the team in its dealings with outsiders.
ITems:
He puts team welfare above the welfare of any individual member.
He is spokesman for the team.
He defends the team against criticism.
He takes the blame when outsiders criticize the team.
He stresses the importance of high morale on the team.
He looks out for the personal welfare of individual team members.
He uses his influence with outsiders in the interest of the team.
He sees that a team member is rewarded for a job well-done.
He stands up for the team even if it makes him unpopular.

APPENDIX 5

LEARNING ENVIRONMENT INVENTORY SUBSCALES

COHESIVENESS - feeling of intimacy or oneness developed in a team.
Items:
1. Members of the team do favors for one another.
2. A player has the chance to get to know all other players on the team.
32. Members of the team are personal friends.
56. All players know each other very well.
58. Players are not in close enough contact to develop likes or dislikes for one another. (reverse)
71. The team is made up of individuals who do not know each other well. (reverse)
91. Each player knows the other members of the team by their first names.

DIVERSITY - extent to which the team provides for a diversity of player interests and activities.
Items:
4. The team has players with many different interests.
11. Interests vary greatly within the team.
34. Some players are interested in completely different things than other players.
37. In practice team members have time to work on their specialty skills.
72. The team divides its efforts among several purposes.
86. Team members are working toward different goals.
95. Different players vary a great deal regarding which aspect of the practices they are interested in.

FORMALITY - the extent to which behavior within the team is guided by formal rules.
Items:
7. Players who break the team rules are penalized.
16. The team has rules to guide its activities.
48. Players are asked to fullow strict team rules.
59. Practices are rather informal and few rules are imposed. (reverse)
61. There is a recognized right and wrong way of going about team activities during practices.
68. All practice procedures are well-established.
81. There is a set of team rules for team members to follow.

SPEED - perceived rate of progress of the team.
Items:
27. The pace of the practice is rushed.
73. The team has plenty of time to prepare for games. (reverse)
75. Players do not have to rush during specialty drills. (reverse).
85. There is little time for day-dreaming.
87. Many players feel the coach goes too quickly.

93. Some players have difficulty keeping up with others.
102. Game fundamentals are covered quickly.

ENVIRONMENT - physical environment in which practices and games take place.
Items:
2. The equipment players need or want is easily available to them in the teamroom.
12. There are many items of spare equipment and other suitable coaching aids.
26. The players are proud of their team uniforms.
36. The practice area is properly maintained.
55. There are diagrams around the teamroom.
57. Each player has his own equipment locker.
90. There are enough coaches for both individual and group work.

FRICTION - lack of interpersonal harmony on the team.
Items:
8. There is constant bickering among team members.
30. Certain players have no respect for other players.
44. There are tensions among certain groups of players that tend to interfere with team activities.
69. Certain players of the team are responsible for petty quarrels.
82. Certain players do not like other players.
88. Certain players are considered uncooperative.
103. There is an undercurrent of feeling among players that tends to pull the team apart.

GOAL DIRECTION - recognition of goals and their subsequent acceptance by the group.
Items:
10. The team knows exactly what it has to get done during a practice.
23. In practice the objectives of the team are not clearly recognized. (reverse)
60. Players have little idea of what the team is attempting to accomplish during practice sessions. (reverse)
65. The objectives of the practice are specific.
67. Each player knows the goals of the team.
83. The team realizes exactly how much work it is required to do during each practice.
96. Each player on the team has a clear idea of the team goals.

FAVORITISM - benefits shared unequally among members.
Items:
9. The better players' questions are more sympathetically answered than those of the average players.
14. Every member of the team enjoys the same privileges. (reverse)
22. The better players are granted special privileges.
24. Good players are osmetimes exempted from parts of practice.

49. The team is controlled by the actions of a few members who are favored.
74. Players who have past histories of letting the team down are discriminated against.
98. Certain players are favored more than the rest.

CLIQUENESS - subgroups, or cliques within the team.
Items:
5. Certain players work only with their close friends.
20. Players cooperate equally with all team members. (reverse)
28. Some players refuse to mix with the rest of the team.
31. Some groups of players work together regardless of what the rest of the team is doing.
76. Certain groups of friends tend to sit together in the teamroom.
97. Most players cooperate equally with other team players. (reverse)
100. Certain players stick together in small groups.

SATISFACTION - how much the players like the team, the activity or the coach.
Items:
6. The players enjoy their work during pracitce.
17. Personal dissatisfaction with the team is too small to be a problem.
21. Many players are dissatisfied with much that the team does during practice. (reverse)
38. There is considerable dissatisfaction with the work of the team. (reverse)
52. The players look forward to coming to team practices.
63. After a practice, the students have a sense of satisfaction.
79. Players are well-satisfied with the work of the team.

DISORGANIZATION - extent to which players perceive the team as disorganized.
Items:
3. There are long periods during which the team does nothing.
19. In practice the work of the team is frequently interrupted when some players have nothing to do.
33. The team is well organized. (reverse)
40. The team is disorganized.
45. The team is well-organized and efficient. (reverse)
70. Many team members are confused by what goes on in practices.
94. There is a great deal of confusion during practices.

DIFFICULTY - perceived difficulty of training.
Items:
13. The work of the team is difficult.
46. Players are constantly challenged.
53. Any person who tries out can make the team. (reverse)
66. Players find practices hard.

78. The coaching points presented are too elementary for many players. (reverse)
101. Most players consider the team practices too easy. (reverse)
104. Many students in the school would have difficulty making the team.

APATHY - indicates whether players feel no affinity with team activities.
Items:
39. Failure of the team would mean little to individual members.
50. Players don't care about the future of the team as a group.
54. Members of the team don't care what the team does during practice.
84. Players share a common concern for the success of the team. (reverse)
89. Most students sincerely want the team to be a success. (reverse)
92. Failure of the team would mean nothing to most team members.
99. Players have a great concern for the progress of the team. (reverse)

DEMOCRATIC - extent to which players share in decisions.
Items:
25. Team decisions tend to be made by all the players.
29. Decisions affecting the team tend to be made democratically.
35. Certain players have more influence on the team than others. (reverse)
42. Certain players impose their wishes on the whole team. (reverse)
51. Each member of the team has as much influence as any other member.
62. What the team does is determined by all the players.
80. A few members of the team have much greater influence than the other members. (reverse)

COMPETITIVENESS - amount of intrateam rivalry.
Items:
15. Most players want to perform better than their friends perform.
41. Players compete to see who can do the best job.
43. A few of the team members always try to do better than the others.
47. Players want to compete with their teammates during practices.
64. Most players cooperate rather than compete with one another. (reverse)
77. There is a great deal of competition on the team.
105. Players seldom compete with one another. (reverse)

APPENDIX 6

DALHOUSIE COACH OBSERVATION SCHEDULE CATEGORY DESCRIPTIONS

FEEDBACK-REWARD (F-R)
1. Feedback: The coach provides information in order to tell the athlete that his performance was satisfactory.
2. Reward: The coach demonstrates pleasure with the behavior of an athlete.

CORRECTING-PROHIBITING (C-P)
1. Correcting: The coach provides information in order to tell the athlete that his performance was not satisfactory and how it must be altered to continue further.
2. Prohibiting: The coach disciplines or openly displays displeasure with the behavior of an athlete, group or team.

QUESTIONING (Q)
1. Questioning: The coach asks a question related to the subject matter.

DIRECTING-EXPLAINING-INFORMING (D-E-I)
1. Directing: The coach directs an athlete, group or class to do something directly related to the subject matter.
2. Explaining: The coach explains, elaborates, or summarizes previous material or paraphrases a statement that was not understood previously.
3. Informing: The coach answers an athlete's question.

MONITORING-ATTENDING (M-A)
1. Monitoring: The coach surveys the activity environment without focusing on a particular individual.
2. Attending: The coach listens or pays attention to what a student or group is doing or saying.

MANAGING (M)
1. Managing: The coach engages in behaviors which lead up to but are not directly related to a learning situation or the subject matter.

NO ACTIVITY (N A)
1. No Activity: The coach is not involved in verbal or non-verbal activity relevant to the class or subject matter.

APPENDIX 7 COACHES QUESTIONNAIRE

INSTRUCTIONS

Coaches differ in the ways they think about athletes with whom they work. This may be important in working with others. Please give your immediate, first reaction to the items on this page.

Below, are listed pairs of words which are opposite in meaning, such as Very Neat and Not Neat. You are asked to describe an athlete you have coached by placing an "X" in one of the eight spaces on the line between the two words.

Each space represents how well the adjective fits the athlete you are describing, as if it were written:

Very Neat	8	7	6	5	4	3	2	1	Not Neat
	Very Neat	Quite Neat	Some what Neat	Sli- ghtly Neat	Sli- ghtly Untidy	Some what Untidy	Quite Untidy	Very Untidy	

For example: If you were to describe the athlete with whom you are able to work least well, and you ordinarily think of him as being quite neat, you would put an "X" in the second space from the words Very Neat, like this:

Very Neat	8	7 (X)	6	5	4	3	2	1	Not Neat
	Very Neat	Quite Neat	Some what Neat	Sli- ghtly Neat	Sli- ghtly Untidy	Some what Untidy	Quite Untidy	Very Untidy	

If you ordinarily think of the athlete with whom you can work least well as being only slightly neat, you would put your "X" as follows:

Very Neat	8	7	6	5 (X)	4	3	2	1	Not Neat
	Very Neat	Quite Neat	Some what Neat	Sli- ghtly Neat	Sli- ghtly Untidy	Some what Untidy	Quite Untidy	Very Untidy	

If you would think of him as being very untidy, you would use the space nearest the words Not Neat.

Very Neat	8	7	6	5	4	3	2	1 (X)	Not Neat
	Very Neat	Quite Neat	Some what Neat	Sli- ghtly Neat	Sli- ghtly Untidy	Some what Untidy	Quite Untidy	Very Untidy	

Look at the words at both ends of the line before you put your "X." Please remember that there are no right or wrong answers. Work rapidly; your first answer is likely to be the best. Please do not omit any items, and mark each item once.

LPC

NAME ⊢————————————⊣

TEAM ⊢————————————⊣

DATE ⊢————————————⊣

SPORT ⊢————————————⊣

Now think of the athlete <u>with whom you can work least well.</u> He may be someone you coach now, or he may be someone you coached in the past. He does not have to be the athlete you <u>like</u> least well, but should be the person with whom you had the most difficulty in obtaining <u>maximal athletic performance</u>. Describe this athlete as he appears to you.

Pleasant	:——:——:——:——:——:——:——:——:	Unpleasant
Friendly	:——:——:——:——:——:——:——:——:	Unfriendly
Rejecting	:——:——:——:——:——:——:——:——:	Accepting
Helpful	:——:——:——:——:——:——:——:——:	Frustrating
Unenthusiastic	:——:——:——:——:——:——:——:——:	Enthusiastic
Tense	:——:——:——:——:——:——:——:——:	Relaxed
Distant	:——:——:——:——:——:——:——:——:	Close
Cold	:——:——:——:——:——:——:——:——:	Warm
Cooperative	:——:——:——:——:——:——:——:——:	Uncooperative
Supportive	:——:——:——:——:——:——:——:——:	Unsupportive
Boring	:——:——:——:——:——:——:——:——:	Interesting
Quarrelsome	:——:——:——:——:——:——:——:——:	Harmonious
Self-Assured	:——:——:——:——:——:——:——:——:	Hesitant
Efficient	:——:——:——:——:——:——:——:——:	Inefficient
Gloomy	:——:——:——:——:——:——:——:——:	Cheerful
Open	:——:——:——:——:——:——:——:——:	Guarded

TEAM ATMOSPHERE SCALE

NAME _____

TEAM _____

DATE _____

SPORT _____

Describe the atmosphere of your present team by checking the following items.

	8	7	6	5	4	3	2	1	
Friendly	:	:	:	:	:	:	:	:	Unfriendly
Accepting	:	:	:	:	:	:	:	:	Rejecting
Satisfying	:	:	:	:	:	:	:	:	Frustrating
Enthusiastic	:	:	:	:	:	:	:	:	Unenthusiastic
Productive	:	:	:	:	:	:	:	:	Nonproductive
Warm	:	:	:	:	:	:	:	:	Cold
Cooperative	:	:	:	:	:	:	:	:	Uncooperative
Supporting	:	:	:	:	:	:	:	:	Hostile
Interesting	:	:	:	:	:	:	:	:	Boring
Successful	:	:	:	:	:	:	:	:	Unsuccessful

Thank you very much for your time and consideration.

01:55.07 1.452 RC=0

APPENDIX 8

RAW TEAM SUBSCALE SCORES ON THE CBDQ (N=40)

	SUBSCALE				
TEAM	1	2	3	4	5
1	19.33	23.17	21.0[illegible]	22.33	22.17
2	20.33	24.00	20.0[illegible]	2[illegible].67	22.33
3	19.40	24.00	19.4[illegible]	23.00	22.20
4	16.40	19.60	16.8[illegible]	19.80	16.00
5	22.83	24.17	21.83	22.17	22.67
6	20.00	20.40	20.4[illegible]	22.60	22.60
7	19.50	23.50	23.0[illegible]	27.50	21.00
8	15.86	17.43	18.8[illegible]	20.71	17.29
9	16.50	22.50	18.83	24.67	18.83
10	20.00	22.75	22.87	24.62	23.00
11	17.17	24.17	15.67	20.17	19.67
12	14.67	20.00	18.0[illegible]	22.33	18.67
13	18.33	22.83	19.33	25.33	19.00
14	20.71	24.00	21.66	25.14	21.71
15	19.75	22.50	20.87	23.00	20.63
16	18.71	21.86	19.71	22.43	19.86
17	14.75	20.25	21.75	19.25	21.25
18	19.75	25.50	17.75	21.37	18.37
19	16.12	22.62	20.50	26.00	17.87
20	17.83	17.83	16.67	18.00	20.00
21	19.00	23.37	20.38	24.75	21.88
22	20.12	20.00	17.75	22.62	19.37
23	23.00	23.60	30.00	26.80	23.00
24	23.37	27.13	25.38	21.37	28.38
25	16.67	20.17	18.50	22.50	18.33
26	21.33	25.83	19.83	23.67	22.17
27	19.14	25.43	23.57	27.00	22.71
28	18.12	19.50	14.75	21.62	19.87
29	14.60	16.00	18.20	23.60	15.00
30	21.37	27.62	25.00	21.62	22.13
31	15.75	19.37	14.25	21.25	20.00
32	20.57	21.14	18.71	18.00	19.29
33	18.17	21.17	18.00	25.00	18.67
34	21.50	20.38	21.00	23.00	21.75
35	22.50	24.50	26.25	21.50	22.50
36	21.83	21.33	17.00	16.83	20.00
37	17.86	21.29	19.71	22.57	19.57
38	17.86	19.43	16.29	22.86	21.29
39	20.57	25.00	16.43	21.57	24.57
40	18.40	23.60	20.60	25.00	20.40

APPENDIX 9

RAW TEAM SUBSCALE SCORES ON THE LEI (N=40)

	SUBSCALE							
TEAM	1	2	3	4	5	6	7	8
1	20.50	20.17	15.83	18.17	15.50	19.33	16.67	19.50
2	18.00	21.75	17.62	17.87	17.12	21.75	17.75	14.75
3	22.60	18.60	16.60	16.00	17.60	17.20	19.40	13.20
4	21.67	22.33	20.67	19.33	19.33	23.00	21.00	15.33
5	22.57	19.14	16.29	17.57	18.43	19.57	17.66	16.71
6	20.00	20.25	19.50	18.37	17.62	18.37	19.00	18.25
7	20.75	18.25	15.50	17.25	15.75	19.00	16.25	15.50
8	22.00	20.43	17.29	18.14	19.14	18.14	20.00	15.14
9	20.83	20.83	15.33	18.67	16.50	18.83	18.17	17.00
10	22.14	19.86	16.43	17.43	16.00	18.86	16.29	17.29
11	19.87	19.87	20.12	15.87	17.62	17.00	20.25	14.62
12	19.75	19.13	16.50	16.37	19.50	16.75	19.13	13.64
13	19.37	20.00	15.37	17.87	17.50	20.00	17.38	15.25
14	21.29	19.71	17.57	18.14	18.43	16.86	18.66	15.86
15	21.00	21.00	19.86	16.86	18.14	18.57	19.43	13.14
16	23.50	20.17	19.50	17.33	16.83	18.00	20.50	16.67
17	23.67	21.00	15.00	18.00	20.33	13.67	20.67	13.00
18	21.50	19.25	16.62	17.75	16.88	15.75	20.00	17.00
19	22.60	19.60	16.40	16.80	19.00	14.20	20.00	12.00
20	21.14	20.86	19.71	19.71	19.14	20.71	19.71	15.71
21	25.50	21.75	19.00	16.50	21.50	15.00	22.25	13.00
22	20.71	20.00	20.71	17.29	16.57	19.71	19.66	15.71
23	21.80	18.20	19.00	14.00	18.80	17.40	18.60	15.60
24	22.00	20.25	14.62	17.25	15.37	17.67	15.37	16.12
25	24.00	18.60	21.20	16.60	20.40	11.60	22.20	11.40
26	20.44	19.56	14.67	17.00	16.89	20.00	16.33	15.22
27	21.40	18.80	15.00	17.60	14.60	14.60	17.60	13.00
28	21.67	19.83	19.83	18.50	16.50	20.00	20.17	14.00
29	22.17	19.50	19.33	16.67	20.17	13.67	22.17	14.83
30	21.00	22.00	16.33	17.00	15.33	23.33	15.33	18.33
31	24.37	20.25	23.00	16.12	20.12	16.00	20.75	13.00
32	21.62	21.00	19.37	18.50	18.88	20.12	19.25	17.62
33	21.33	18.50	16.33	17.00	19.67	13.33	20.33	11.00
34	20.00	20.29	16.14	18.29	16.00	19.00	15.57	16.43
35	21.80	20.40	16.60	16.60	19.00	23.20	17.60	18.40
36	23.50	21.62	21.62	17.25	21.25	16.75	21.75	15.25
37	21.00	18.75	18.62	17.87	17.38	18.62	16.75	15.12
38	24.00	19.43	19.57	16.43	20.86	15.86	23.00	12.43
39	22.40	21.40	21.60	15.40	19.20	15.60	22.40	16.60
40	20.40	20.00	18.00	17.20	18.60	21.00	17.60	17.20

	SUBSCALE						
TEAM	9	10	11	12	13	14	15
1	18.00	15.50	17.33	18.00	14.33	15.33	16.50
2	21.12	16.37	18.37	17.25	17.12	14.50	22.00
3	15.00	20.00	13.60	19.80	11.40	17.00	18.20
4	23.00	17.33	12.33	18.33	13.33	17.00	21.33
5	20.00	16.66	18.00	19.43	14.43	15.43	21.43
6	18.50	16.87	16.25	17.00	15.62	16.75	17.50
7	16.00	15.50	20.25	17.50	16.75	18.00	19.00
8	18.00	18.71	13.14	18.71	12.86	16.00	19.71
9	17.63	17.00	16.33	17.17	12.83	15.67	20.50
10	16.43	17.14	16.57	15.71	15.14	16.71	18.29
11	18.00	17.87	13.62	22.00	12.87	17.12	18.88
12	16.37	18.88	14.62	19.75	15.25	17.25	16.50
13	20.12	16.25	18.62	19.25	17.00	16.87	20.87
14	15.57	21.43	14.43	19.57	14.57	17.43	17.29
15	18.14	19.29	14.57	19.71	12.71	16.86	18.57
16	16.17	17.67	15.00	20.50	12.33	17.00	18.33
17	16.33	20.67	12.33	19.33	12.33	18.67	17.00
18	18.25	19.13	14.12	20.00	12.87	17.12	18.00
19	18.20	16.80	12.60	19.00	12.00	18.40	19.00
20	19.71	17.29	15.29	22.00	15.71	16.14	19.43
21	15.00	21.50	12.00	19.50	9.00	16.50	18.75
22	18.14	18.43	15.14	18.43	13.86	17.43	17.86
23	17.20	17.40	15.20	17.60	14.60	19.00	20.00
24	17.00	16.87	20.38	15.87	16.62	15.62	19.50
25	13.60	21.20	11.40	19.60	10.80	21.80	17.40
26	20.11	13.00	19.67	17.67	18.89	16.89	20.89
27	16.80	18.20	15.60	16.60	14.20	18.20	18.40
28	19.63	17.33	16.33	21.33	13.00	17.33	20.50
29	16.50	21.33	10.17	19.67	11.17	17.83	17.50
30	20.33	17.33	16.67	17.00	16.33	14.00	22.00
31	17.38	20.12	12.50	21.75	12.12	18.62	19.25
32	19.50	15.62	15.50	20.50	15.12	15.12	20.38
33	14.83	19.83	11.67	19.67	11.00	18.17	17.17
34	16.86	14.57	19.86	18.00	18.43	17.14	18.71
35	20.40	14.40	18.00	20.00	13.40	14.00	19.00
36	18.37	19.25	11.87	21.12	12.62	16.75	20.75
37	17.12	15.75	17.50	19.75	14.37	14.75	20.12
38	17.14	21.43	11.00	19.57	10.00	16.86	17.43
39	15.00	19.40	12.00	20.00	12.00	16.20	17.20
40	19.00	15.00	16.20	18.00	15.00	15.00	19.00